# Understanding Local Residents' Deer Population Preferences

## Results from a 2018 Survey of 7 Wildlife Management Unit Aggregates

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## EXECUTIVE SUMMARY

The New York State Department of Environmental Conservation (DEC) is transitioning to a system of 24 wildlife management unit (WMU) aggregates for deer management. The aggregates combine multiple WMUs to create fewer, larger units that make better use of existing deer harvest data in deer management decisions. Aggregation of WMUs will change the geographic scale at which deer population goals are set, and that change necessitates modifications to the way stakeholders are engaged to inform deer management decisions. Program administrators in the DEC made a decision to collect stakeholder input via representative surveys of residents in aggregated WMUs. In 2018, DEC sponsored mail surveys in 7 aggregated wildlife management units (AWMUs) to learn more about AWMU residents' deer population preferences. Information from the surveys will inform DEC decisions about future deer population objectives in the AWMUs where those data were collected.

The purpose of this publication is to report findings from the 2018 surveys and results of analyses to understand reasons for deer population preference in 7 AWMUs.

### Study objectives

1. Identify New York State residents' preference for future deer population in the AWMU in which they reside.

2. Improve understanding of the factors that influence New York State residents' preference for future deer population in the AWMU in which they reside.

## METHODS

### Survey instrument and implementation

In cooperation with a team of DEC wildlife professionals (hereafter referred to as the contact team), we developed a self-administered questionnaire to address our research objectives. The questionnaire characterized property owners': perception of change in local deer population over the previous 5 years, deer population preference, deer-related attitudes and beliefs, attribution of importance or urgency of deer management (i.e. salience as an issue needing attention), deer-related interests, perceived deer-management priorities, and personal and sociodemographic characteristics.

DEC identified 7 AWMUs to be surveyed in project year 1 (i.e., Central Finger Lakes, Central New York, Eastern Lake Plains, Mid Lake Plains, Mohawk Valley, Suffolk-Westchester, and Western Lake Plains). (See page 5 for study area map). We sampled 1,250 property owners with mailing addresses in each of the AWMUs surveyed in year 1 (i.e., total sample of 8,750). We drew the samples for each AWMU from the zip codes that DEC staff identified for each of the AWMUs. We sampled property owners in multiple property tax codes. The sample included owners of 1-family, 2-family, and 3-family year-round residences, rural residences with acreage, properties used in agricultural production that contained a primary residence, recreational use properties, estates, and mobile homes. We did not include owned property in the sample unless

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the address listed for the property owner was in the same zip code as the listed property. This step ensured that all persons contacted were residents of the AWMU being surveyed.

We implemented survey mailings between February 14, 2018 and March 14, 2018. We contacted each member of the sample up to 4 times (i.e., an initial letter and questionnaire, a reminder postcard a week later, a second reminder letter and replacement questionnaire 2 weeks after the first reminder, and a final reminder about 1 week after the third mailing). We contracted the Survey Research Institute at Cornell University (SRI) to complete follow-up telephone interviews with a sample of at least 50 nonrespondents in each of the aggregates sampled. SRI completed a total of 350 interviews with nonrespondents between April 2, 2018 and April 30, 2018. Interviews contained 19 key questions from the mail survey and took 5 minutes or less to complete.

### Analysis

All analyses were completed using IBM SPSS Statistics for Windows, Version 24.0. We used chi square tests to identify respondent-nonrespondent differences and associations between categorical variables and deer population preference. We used binary logistic regression to develop models predicting deer population preference.

## RESULTS

We received a total of 3,192 completed questionnaires from a pool of 7,737 deliverable questionnaires, yielding an overall response rate of 41%. Response rates varied by AWMU, ranging from a low of 32% in the Suffolk-Westchester AWMU to a high of 49% in the Central Finger Lakes AWMU.

Mean age of respondents was 62 years. In all AWMUs the majority of respondents were male (from 54% in Westchester-Suffolk AWMU to 67% in the Central Finger Lakes AWMU). Respondents were most likely to live in a rural area outside a village/hamlet (44%) or a village or hamlet (27%) (21% lived in a small city; 8% lived in a large city). The percentage who lived in a rural area ranged widely across the 7 AWMUs surveyed, from 13% in the Westchester-Suffolk AWMU to 66% in the Central Finger Lakes AWMU. These characteristics suggest that respondents are older, more likely to be male, and more likely to be rural than the state population as a whole.

Over a quarter (27%) of all respondents participated in deer hunting, even though less than 10% of adult New York State residents hunt are estimated to hunt. The percentage of respondents who were deer hunters varied by AWMU: Central Finger Lakes 35%, Central New York 22%, Eastern Lake Plains 39%, Middle Lake Plains 23%, Mohawk Valley 27%, Westchester-Suffolk 8%, Western Lake Plains 28%.

### Respondent-nonrespondent comparisons

Respondents and nonrespondents did not differ with regard to their level of concern about several deer-related impacts. For example, both respondents and nonrespondents expressed the highest levels of concern about Lyme or other tick-borne diseases and deer-vehicle collisions. Majorities of both respondents and nonrespondents believed it was very important or extremely

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important for DEC to consider tick-borne illnesses and deer-vehicle collisions when managing deer in their local area.

But we found a number of statistically-significant differences between respondents and nonrespondents. Respondents were more likely than nonrespondents to: be male (66% vs. 51%); hunt deer (27% vs. 18%); be concerned about deer damage to gardens (69% vs. 59%); be concerned about deer damage to forests and native plants (67% vs. 50%); or want the deer population to increase (21% vs. 11%)

During preliminary analysis, we explored whether respondent-nonrespondent differences could be addressed in part by weighting to adjust the male-female ratio. We found that weighting the data based on gender had little effect on the key variable from the survey (i.e., deer population preference). Therefore, the study contact team made a decision to not have us adjust the data based on gender. The results presented in this report have not been weighted to adjust for respondent-nonrespondent differences.

**Deer population preference**

Deer population preferences varied by AWMU. In all aggregates, about a third of respondents desired no change in the local deer population.

The proportion of respondents who preferred a decrease in the local deer population ranged from 23% (Eastern Lake Plains AWMU) to 47% (Suffolk-Westchester AWMU). The proportion of respondents who preferred an increase in the local deer population ranged from 8% (Suffolk-Westchester AWMU) to 31% (Eastern Lake Plains AWMU). In the Middle Lake Plains and Suffolk-Westchester AWMUs the proportion of respondents who desired a decrease in the deer population markedly exceeded the proportion who desired an increase.

**Variables correlated with deer population preference**

We used the chi square statistic to test relationships between deer population preference and other categorical variables measured in the survey. We found significant relationships between deer population preference and the following variables.

- Property owners wanting the deer population to change, whether they preferred an increase or decrease, expressed the sentiment that deer management was personally important to them. Desire for change was held with some conviction. Conversely, respondents who placed low personal importance on deer management were more likely than other respondents to prefer no change or have no preference regarding change in the size of the local deer population.

- Interest in viewing local deer. Most respondents who had high interest in viewing deer preferred that the local deer population stay about the same level or increase. Most respondents who had no interest in viewing deer preferred that the local deer population decrease or stay about the same level.

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- Participation in deer hunting. Hunters were much more likely than nonhunters to prefer a deer population increase.

- Concerns about local deer. Respondents who had high levels of concern about negative impacts of deer (i.e., damage to gardens, damage to farmers' crops, damage to forests, tick-borne diseases, or deer-vehicle collisions) were more likely than those with low levels of concern to prefer a decrease in deer population size.

- Perceived change in local deer population. Results show a strong correlation between perceived change in the deer population and deer population preference. AWMUs where substantial portions of respondents perceived a deer population increase also had a substantial proportion of respondents who preferred a reduction in deer population in their area. For example, in the Suffolk-Westchester AWMU about 48% of respondents believed that their local deer population had increased in the previous 5 years, and 47% of respondents in that area preferred that the deer population decrease in the future.

- Attitude toward local deer. Respondents who enjoyed deer without worry were more likely than other respondents to prefer a deer population increase. Those who worried about deer-related problems, or regarded deer as a nuisance, were more likely than others to prefer a deer population decrease.

- Perceived cost-benefit ratio of local deer population. Respondents who believed the benefits of deer outweighed the costs were more likely than other respondents to prefer a deer population increase. Those who believed deer-related costs outweighed deer-related benefits were more likely than other respondents to want the deer population to go down or stay about the same level.

**Predictors of deer population preference**

The correlational analysis presented above demonstrates associations between pairs of survey variables, but it does not allow the researcher to consider potential confounding effects or effect modifiers. Regression analysis makes it possible to measure the strength of association between multiple independent variables and a dependent variable adjusting for potential confounding effects. Thus, we conducted logistic regression analyses to identify factors that explain deer population preference.

Preference for a population decrease. Eight factors were significant predictors of preference for a deer population decrease in 1 or more AWMUs. In any given AWMU, as few as 3 and as many as 6 variables were significant predictors. Low interest in deer viewing and high concern about browse damage were predictive of a preference for deer population decrease in all AWMUs; high concern about deer-vehicle collisions was predictive in 5 AWMUs.

Preference for a population increase. Seven factors were significant predictors of preference for a deer population increase in 1 or more AWMUs. In any given AWMU, as few as 1 and as many as 4 variables were significant predictors. High interest in deer viewing was predictive of a deer

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population increase in all AWMUs, high interest in deer hunting was predictive in 4 AWMUs, and low concern about browsing damage was predictive in 4 AWMUs.

## NEXT STEPS

Analysis of data from this survey was provided to DEC in summer 2018. This survey will be repeated in 2019 and beyond until the same data have been collected in all AWMUs. DEC personnel will use the data from these surveys, along with other information, to determine deer population goals in each AWMU.

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## ACKNOWLEDGMENTS

We extend our appreciation to property owners of New York State for their participation in this study. Many staff members within the New York State Department of Environmental Conservation (DEC) Bureau of Wildlife helped during various phases of this research. For their assistance, we express our thanks to Sue Booth-Binczik, Jeremy Hurst, Courtney LaMere, Leslie Lupo, and Ryan Rockefeller.

The Survey Research Institute (SRI) at Cornell University conducted nonrespondent follow-up interviews. Karlene Smith and other CCSS staff assisted with survey implementation and data coding. Former CCSS staff member Emily Pomeranz contributed to all aspects of the 2017 pilot project that informed this research.

Our survey instrument and request to conduct survey research was reviewed and granted approval by the Cornell University Office of Research Integrity and Assurance (Institutional Review Board for Human Participants Protocol ID# 1101001927).

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# INTRODUCTION

The New York State Department of Environmental Conservation (DEC) is transitioning to a system of 24 wildlife management unit (WMU) aggregates for deer management. The aggregates combine multiple WMUs to create fewer, larger units that make better use of existing deer harvest data in deer management decisions. Aggregation of WMUs will change the geographic scale at which deer population goals are set, and that change necessitates modifications to the way stakeholders are engaged to inform deer management decisions.

CCSS staff assisted with a pilot project that explored an alternative to the citizen task forces approach that DEC had used since the 1990s for gathering stakeholder preferences on deer population levels in aggregated wildlife management units (AWMUs). The pilot program began in 2015 with a survey of 3,000 randomly selected residents of the Central Finger Lakes AWMU (Siemer et al. 2015). The survey collected information from residents about values they attribute to deer, their experiences with deer, and their concerns about deer impacts. The pilot also included an educational effort targeting Central Finger Lakes AWMU residents and the general public in January 2016. The educational effort was comprised of 2 webinars designed to: (1) help the public understand DEC's deer management program, (2) share results of the aggregate-wide public survey, and (3) convey information to the public regarding deer, deer impacts on people and the environment, and deer management issues and challenges (Siemer et al. 2017).

Following the webinar series, a small group of interested citizens, referred to as a stakeholder input group (SIG), was convened in March 2016 for the purpose of identifying and prioritizing the benefits and costs associated with deer. The results of the aggregate-wide survey were provided to the SIG group to help inform their deliberation. The SIG was piloted as a replacement for the citizen task forces used previously by the DEC for seeking public recommendations on desired deer population levels within individual WMUs.

Although the approach was evaluated favorably by many participants, the SIG process failed to meet pilot objectives regarding the involvement of stakeholders with diverse interests (Pomeranz et al. 2017). Concerned about ensuring diverse stakeholder interests were identified and considered in management, DEC made a decision to revise the public input process to focus on representative surveys of residents in AWMUs. In 2018, DEC sponsored mail surveys in 7 AWMUs to learn more about AWMU residents' deer population preferences. Information from the surveys will inform DEC decisions about future deer population objectives in the AWMUs where those data were collected.

The purpose of this report is to present findings from the 2018 surveys and results of analyses to understand predictors of deer population preference.

## Project Objectives

The DEC wildlife professionals (hereafter referred to as the contact team) who provided oversight for this research identified local deer population preferences as the focal point for decisions about future deer population objectives in each AWMU. The need for an estimate of deer population preferences in each AWMU led to articulation of Study Objective 1.

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> **Study Objective 1:** Identify New York State residents' preference for future deer population in the AWMU in which they reside.

The DEC contact team also sought greater understanding of factors that influence deer population preferences. That information led to articulation of Study Objective 2.

> **Objective 2:** Improve understanding of the factors that influence New York State residents' preference for future deer populations in the AWMU in which they reside.

## CONCEPTUAL FOUNDATION

### Capacity Concepts

Deer population preference is considered to be an indicator of an individual's acceptance capacity for deer, so we reviewed capacity concepts to provide the conceptual foundation for this research. Several capacity concepts have been applied to wildlife management issues over time. Carpenter and Decker (2000:10) point out a common theme that runs through every definition of capacity.

> *One notion inherent to all these definitions is the capacity of a biological or human system to 'carry the burden' of a particular wildlife population or density of animals in a specific geographic area. The burden to be considered can be thought of as the effect or 'impact' of wildlife on its environment, which has biological and human socioeconomic characteristics. Impacts can be positive or negative, beneficial or detrimental, in either the biological or human domains."*

It is also important to note that the proponents of each approach acknowledge that the relationships between wildlife population and impacts of that population on landscapes or people may not be linear, and often are not well understood by environmental or social scientists. Thus, the proponents of these different conceptual approaches agree that changing the size of a wildlife population is not the only means (and in specific contexts may not be the most effective means) to manage the impacts that determine social carrying capacity (Decker and Purdy 1988, Minnis and Peyton 1995, Enck and Bath 2012, Conover and Dinkins 2012).

Biological carrying capacity. The concept of biological carrying capacity (BCC) developed in the field of range management about a century ago. Widespread degradation of western range was precipitated by rapid growth in the western livestock industry between 1870 and 1890 (Young 1998), demonstrating to both ranchers and scientists that the western grasslands had a "carrying capacity." Through studies conducted around the turn of the twentieth century, range scientists defined BCC as the maximum number of animal unit days that could be supported without a downward trend in forage quantity, forage quality, or soil quality (Stoddart and Smith 1955). Young (1998:66) describes how BCC "became a conceptual tool to bridge the perceived gap between practical and scientific ideals in range management." About 2 decades later, Aldo Leopold applied the BCC concept to the emerging field of game management. He defined BCC as, "the maximum density of wild game which a particular range is capable of carrying" (Leopold 1933). Paul Errington, Eugene Odem and other ecologists subsequently refined and strengthened measures of BCC (Young 1998, McCullough 1992). BCC continues to be a

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concern in contemporary deer management in New York, as evidenced by the DEC objective to maintain deer impacts on forested ecosystems at levels that support sustainable forest habitats. (Objective 5.1, Deer Management Plan 2012–2016, http://www.dec.ny.gov/docs/wildlife_pdf/deerplan2012.pdf)

Cultural carrying capacity. Though formal studies of human tolerance for deer damage go back to the 1960s (Craven et al. 1992), efforts to define carrying capacity for deer from a social perspective did not emerge until the 1980s. Based on experience with suburban deer management issues in New Hampshire, Ellingwood and Spigesi (1986) suggested that in every community there is a "cultural carrying capacity" (CCC) beyond which people will not support or coexist with deer. They linked CCC to deer population size, defining it as the maximum number of deer that can compatibly co-exist with a local human population. Other scholars labeled the same phenomenon as "sociological carrying capacity" (Stoll and Mountz 1983, Decker et al. 1985, Purdy 1987).

Wildlife acceptance capacity. Decker and Purdy (1988) developed the concept of "wildlife acceptance capacity (WAC)," which they defined as the maximum wildlife population level in an area that is acceptable to an individual or group of people. They suggested that stated preferences for a deer population level could be used as an indicator of WAC and they encouraged wildlife managers to focus on identifying WAC for key stakeholders (e.g., farmers, hunters, motorists) at appropriate geographic scales as a source of input to consider when evaluating deer population objectives for that area. DEC sponsored multiple studies in the 1980s and 1990s to identify WAC for key stakeholders and improve understanding of factors that influence WAC.

Social carrying capacity. Minnis and Peyton (1995:20) proposed the concept of cultural carrying capacity (CCC), which they defined as "the wildlife population level in an area that produces the most manageable amount of issue activity at a particular time." Peyton et al. (2001) refined and relabeled the concept as social carrying capacity (SCC) and applied the idea in a study of tolerance for black bears in southern Michigan. They defined SCC as, "that population level or frequency of interactions which presents a manageable level of issues or stakeholder conflicts and is defined when stakeholder groups' latitude of acceptance overlap sufficiently; i.e., when they agree on some range of tolerable bear interactions/numbers" (Peyton et al. 2001:15). The SCC approach to measuring capacity builds upon, but differs from the WAC approach in several important ways. While the WAC approach focuses on establishing when people perceive a wildlife population to be too high, the SCC approach focuses on establishing when people perceive a population to be too high or too low (i.e., it attempts to establish the range of acceptable wildlife population levels). Second, the SCC approach focuses explicitly on tolerance for specific wildlife-related issues (e.g., deer damage to landscape plantings). For example, survey respondents would be asked to report whether they believe issues such as plant damage or deer-vehicle collisions are at desirable, tolerable, or intolerable levels. Application of the SCC approach entails assessing the latitude of acceptance (i.e., minimum and maximum acceptable population levels) for multiple stakeholder groups.

Wildlife stakeholder acceptance capacity. Carpenter et al. (2000) proposed a modification to the WAC approach called wildlife stakeholder acceptance capacity (WSAC). WSAC was defined as the relative wildlife population level acceptable to a community of stakeholders, determined by a

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mixture of tolerance for problems and desires for benefits from wildlife. The key components of WSAC are its focus on optimizing across a spectrum of stakeholders and focusing on measures of how those stakeholders are impacted by a wildlife population, positively or negatively. It also recommends explicit weighting of stakeholder input in any decision-making process based in stakeholder survey data.

Lischka et al. (2008:502) applied this approach in a study of deer management stakeholders in Michigan. In their study the upper and lower boundaries of acceptance capacity were "defined by the cumulative outcome of perceived positive and negative effects of a wildlife population." Maximum tolerable levels of negative effects associated with deer determined the upper limit of acceptance capacity; desire for deer-related benefits determined the lower limit of WAC (Lischka et al. 2008:502). Impacts were assessed through a multi-step sequence using interdependent survey questions. Though it provides in-depth assessment of impacts, the approach also calls for a level of sophistication in survey design and analysis that wildlife agencies may not find practical for implementation.

**Metrics of Acceptance Capacity**

Researchers have used a few different survey questions in stakeholder surveys to gauge acceptance capacity. The tactic that may be used most often by wildlife agencies is a variant of the question, "Do you want the population of [species name] to increase, decrease, or remain about the same in your [local area, county, region]." In 2017, CCSS staff conducted a comprehensive review of websites from all 50 state wildlife management agencies (Emily Pomeranz, unpublished data) to estimate how many agencies had recently conducted stakeholder research to measure WAC using this question. We found that 14 state wildlife agencies had collected information on stakeholder preferences for deer population changes or perceptions of the deer population size sometime during the past 5 years. Agencies had typically collected this information during the course of developing a long-term (e.g., 10-year) deer management plan or when reassessing local or regional deer population goals. Only 4 agency websites had content that clarified how deer population preference differed by stakeholder group (e.g., in Minnesota 94% of hunters wanted a deer population increase; farmers were evenly split with a third preferring more deer, a third preferring fewer deer, and a third preferring no change, MDNR 2015). Only 1 agency (Georgia Department of Natural Resources) described research to understand why survey respondents preferred a deer population increase or decrease (GDNR 2014). Georgia DNR found that preference for a deer population increase was best explained by an interest in increasing probability of harvesting deer (among hunters) or probability of seeing more deer (among nonhunting residents) (GDNR 2014). Preference for a deer population reduction was best explained by concerns about deer-vehicle collisions (among nonhunting and hunting residents) and concerns about crop, garden, and landscape damage (among landowners).

In addition to asking about deer population preferences, DEC-sponsored studies of deer-management stakeholders in New York have often included an item to assess respondents' overall attitude toward deer. Responses to this question (i.e., *I enjoy deer without worry about deer-related problems; I enjoy deer but worry about problems deer may cause; I do not enjoy deer and regard them as a nuisance; I have no particular feelings about deer*) have been used as a general indicator of tolerance for deer-related problems. For example, this question has been

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used to gauge tolerance for deer in New York communities where disruptive deer-management issues had emerged (e.g., the Village of Cayuga Heights, communities adjacent to Fire Island National Seashore). The proportions of residents who did not enjoy deer and regarded them as a nuisance was 34% in the Village of Cayuga Heights in 1999 (Chase et al. 1999), 21% in the Village of Cayuga Heights in 2007 (Siemer et al. 2007a), and 30% in communities on Fire Island, New York in 2007 (Siemer et al. 2007b). By comparison, in 2015 we found that only 7% of property owners in the Central Finger Lakes Aggregated Wildlife Management Unit (AWMU) reported that they do not enjoy deer and regard them as a nuisance (Siemer et al. 2015). The Central Finger Lakes AWMU is a larger geographic area than Cayuga Heights or the Fire Island seashore, and had lower deer-related issue activity than what was known to exist in Cayuga Heights or Fire Island at the time that those communities were studied.

In recent studies in New York a deer-related costs/benefits question has been used as an indicator of acceptance capacity. This approach asks respondents whether they believe the costs of deer outweigh the benefits associated with deer, the benefits outweigh the costs, or deer-related costs and benefits are about an even tradeoff. Underlying this question is an assumption that stakeholders who believe costs of deer outweigh deer-related benefits will prefer a deer population reduction, because their tolerance for negative deer-related impacts has been exceeded.

**Factors Associated with Tolerance for Deer**

Since the 1980s, tolerance for white-tailed deer populations, particularly in residential areas with high deer densities, has been explored repeatedly in surveys of deer management stakeholders. Across those studies, researchers have identified a range of factors that are associated with tolerance or intolerance for deer. For example, studies have revealed correlations between tolerance for a species and negative experiences with that species (Inskip et al. 2016), involvement in hunting or farming (Minnis and Peyton 1995), evaluative beliefs about wildlife (Riley and Decker 2000), real and perceived risks associated with wildlife (Stout et al. 1993; Riley and Decker 2000, Peyton et al. 2001), and perceived impacts associated with wildlife (Riley et al. 2002, Lischka et al. 2008).

Sociodemographic characteristics, including age (Manfredo and Zinn 1996, Kleiven et al. 2004), gender (Zinn and Pierce 2002), and educational attainment (Riley and Decker 2000, Vaske et al. 2001), have been correlated with values toward and concerns about wildlife. Since general values toward wildlife influence evaluations of interactions with wildlife, researchers hypothesize that they may influence WAC (Zinn et al. 2000, Lischka et al. 2008). We also know that different stakeholder groups (e.g., hunters, farmers, gardeners, motor vehicle operators) may have different levels of tolerance for the same population of animals (Decker and Purdy 1988), because such groups perceive themselves to be impacted differently by that species. Wide divergence in tolerance levels for deer is perhaps best documented for hunters and farmers (for examples see MDNR 2014, D'angelo and Grund 2014, ODNR 2016). Setting deer population objectives is inherently challenging because managers are tasked with striking a balance of these positive and negative impacts for key deer management stakeholders (Decker et al. 2002).

Collectively, the body of research on tolerance for deer suggests that understanding stakeholders' deer-related interests and concerns, deer-related activity involvement, and demographic traits

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may help explain why residents in specific regions of New York State prefer that the deer population in their local area increases, decreases, or remains at about the same level.

Based on previous research, we expected to find that high levels of concern about negative effects of human-deer interactions would be predictive of a preference for a deer population decrease. We expected to find that high levels of interest in seeing or hunting deer would mitigate preference for a deer population reduction. We also expected to find that residents who preferred a deer population decrease would be more likely than other respondents to perceive that the local deer population had increased, believe that costs of deer outweighed the benefits of deer, and report that they enjoy deer, but worry about deer-related problems.

## METHODS

### Survey Instrument

In cooperation with the DEC contact team, we developed a self-administered questionnaire to address our research objectives (Appendix A). The Cornell University Office of Research Integrity and Assurance (Institutional Review Board for Human Participants, Protocol ID#1101001927) approved the questionnaire for use with human subjects.

The questionnaire characterized property owners': perception of change in local deer population over the previous 5 years, deer population preference, deer-related attitudes and beliefs, attribution of importance or urgency of deer management (i.e. salience as an issue needing attention), deer-related interests, perceived deer-management priorities, and personal and sociodemographic characteristics. We also asked respondents what factor they believed should receive the most weight in determining the future deer population level in their local area. This question was intended to provide insight on how property owners prioritize possible objectives for deer management.

### Survey Implementation

DEC identified 7 AWMUs to be surveyed in project year 1 (Figure 1, Table 1).We sampled 1,250 property owners with mailing addresses in each of the AWMUs surveyed in year 1 (i.e., total sample of 8,750). We drew the samples for each AWMU from the zip codes that DEC staff identified for each of the AWMUs. We sampled property owners in multiple residential property tax codes. The sample included owners of 1-family, 2-family, and 3-family year-round residences, rural residences with acreage, properties used in agricultural production that contained a primary residence, recreational use properties, estates, and mobile homes. We did not include owned property in the sample unless the address listed for the property owner was in the same zip code as the listed property. This step ensured that all persons contacted were residents of the AWMU being surveyed.

We implemented survey mailings between February 14, 2018 and March 14, 2018. We contacted each member of the sample up to 4 times (i.e., an initial letter and questionnaire, a reminder postcard, a second reminder letter and replacement questionnaire, and a final reminder about 1 week after the third mailing).

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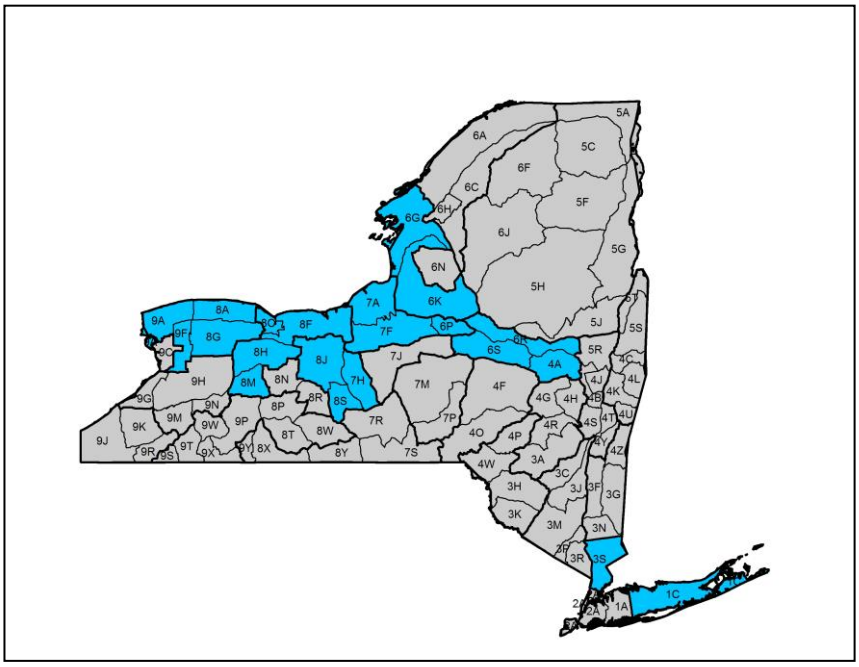


**Figure 1.** Map of New York State showing the geographic areas surveyed in 2018 (in blue).

**Table 1.** Aggregated wildlife management units (AWMUs) sampled in year 1, New York State deer management survey.

| AWMU name | Wildlife management units (WMUs) in the aggregate | Counties entirely or partially in the AWMU |
|---|---|---|
| Central Finger Lakes | 8J, 8S, 7H | Cayuga, Ontario, Schuyler, Seneca, Tompkins, Wayne, Yates |
| Central New York | 6P, 7A, 7F | Cayuga, Madison, Oneida, Onondaga, Oswego, Seneca |
| Eastern Lake Plains | 6G, 6K | Jefferson, Lewis, Oneida, and Oswego |
| Mid Lake Plains | 8C, 8F, 8H, 8M | Cayuga, Genesee, Livingston, Monroe, Ontario, Seneca, Steuben, Wayne, Wyoming |
| Mohawk Valley | 4A, 6R, 6S | Albany, Fulton, Madison, Oneida, Otsego, Herkimer, Montgomery, Saratoga, Schenectady, Schoharie |
| Suffolk-Westchester | 1C, 3S | Suffolk, Westchester |
| Western Lake Plains | 8A, 8G, 9A, 9F | Erie, Genesee, Monroe, Niagara, Orleans |

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We contracted the Survey Research Institute at Cornell University (SRI) to complete follow-up telephone interviews with a sample of at least 50 nonrespondents in each of the AWMUs sampled. SRI completed a total of 350 interviews with nonrespondents between April 2, 2018 and April 30, 2018. Interviews contained 19 key questions from the mail survey and took no more than 5 minutes to complete.

**Analysis**

We completed all analyses using IBM SPSS Statistics for Windows, Version 24.0 (IBM Corp. 2016). We calculated descriptive statistics (frequencies, means) to compare results for each variable in each AWMU. We used chi square tests to identify respondent-nonrespondent differences and associations between categorical variables and deer population preference.

We used binary logistic regression to develop models predicting a preference for a deer population decrease or increase in each AWMU. Before we conducted regression analysis, we assessed multicollinearity among continuous predictor variables (i.e., interests, concerns, age) using Pearson correlation coefficients. Pairs of variables with $r > 0.6$ were considered highly correlated. We estimated the proportion of explained variation in each regression model using Cox & Snell $R^2$ value and Nagelkerke $R^2$ value.

The independent variables considered in this analysis are described in Table 2. We developed 2 questions to assess deer-related interests (i.e., interest in deer viewing, interest in deer hunting). Interests were measured on a 5-point scale (1=not at all interested, 5=extremely interested). We assessed 5 areas of potential deer-related concerns (i.e., concern about garden damage, crop damage, forest damage, tick-borne diseases, and deer vehicle collisions). Concerns were measured on a 5-point scale (1=not at all concerned, 5=extremely concerned). We found that 3 concern items (i.e., concern about garden damage, crop damage, and forest damage) were highly correlated, so we combined those items into a single variable we labeled "BROWSE CON"). We treated interests and concerns as continuous variables in regression analyses. We anticipated that strong deer-related interests would mitigate intolerance. We anticipated that strong deer-related concerns would be associated with deer intolerance.

We developed 6 measures to explore how activity involvement might explain variance in deer tolerance (i.e., participation in deer hunting, gardening, farming, woodlot/forest management, "driving in areas with lots of deer", and hiking/walking in natural areas). These were yes/no questions and were treated as categorical variables in regression analyses. We anticipated that participation in activities that could be adversely impacted by high deer populations (e.g., gardening, farming) would be associated with deer intolerance, and participation in deer hunting would be associated with tolerance for deer.

We included 3 variables to investigate how demographic factors influence tolerance. Gender was translated into a dichotomous variable (1=male, 0=female). With regard to geographic setting, respondents were categorized as living in: a rural area, outside a village or hamlet; a village or hamlet (less than 10,000 people); a small city (10,000 to 50,000 people); or a large city (over 50,000). Age was assessed by asking for year of birth. For analysis purposes, age was treated as a continuous variable and gender and geographic setting were treated as categorical variables.

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**Table 2.** Description of survey questions and variables used to predict preference for a local deer population decrease or increase in aggregated wildlife management units (AWMUs).

| Category | Variable | Survey question | Variable type |
|---|---|---|---|
| Interests and concerns | VIEW INT | How interested are you in deer viewing? | 5 categories (Ref=very int) |
| | HUNT INT | How interested are you in deer hunting? | 5 categories (Ref=very int) |
| | GARDEN CON[1] | How concerned are you about deer damage to gardens and plantings? | 5 categories (Ref=very conc) |
| | CROP CON[1] | How concerned are you about crop losses experienced by local farmers? | 5 categories (Ref=very conc) |
| | FOREST CON[1] | How concerned are you about deer damage to forests and native plants? | 5 categories (Ref=very conc) |
| | DISEASE CON | How concerned are you about Lyme and other tick-borne diseases? | 5 categories (Ref=very conc) |
| | DRVA CON | How concerned are you about deer-vehicle collisions? | 5 categories (Ref=very conc) |
| Activities | DEER HUNT | Activities in which you participate: Deer hunting | Binary (yes or no) |
| | GARDEN | Activities in which you participate: Gardening | Binary (yes or no) |
| | FARM | Activities in which you participate: Farming | Binary (yes or no) |
| | FOREST MGT | Activities in which you participate: manage woodlots or forested land | Binary (yes or no) |
| | DRIVE | Activities in which you participate: Driving in areas with lots of deer | Binary (yes or no) |
| | HIKE | activities in which you participate: Hiking/walking in natural areas | Binary (yes or no) |
| Demographic factors | GENDER | What is your gender? | 2 categories (Ref=Male) |
| | AGE | In what year were you born? | Continuous |
| | SETTING | Which category best describes the place where you currently reside? | 4 categories (Ref=rural) |

[1]Concerns about damage to gardens, farmers' crops, and forests were highly correlated, so these 3 variables were combined into a single aggregate variable (called "BROWSE CON") based on grand mean that ranged from 1 (not at all concerned) to 5 (extremely concerned).

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## RESULTS

Residents returned a total of 3,192 questionnaires from a pool of 7,737 deliverable questionnaires, yielding an overall response rate of 41% (Table 3). Response rates varied by aggregate, ranging from a low of 32% in the Suffolk-Westchester AWMU to a high of 49% in the Central Finger Lakes AWMU.

**Table 3.** Summary of survey response by aggregated wildlife management unit (AWMU), 2018 deer management survey.

| | Aggregated wildlife management units (AWMUs)[1] | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | CFL | CNY | ELP | MLP | MV | SW | WLP | Total |
| Sample size | 1,250 | 1,250 | 1,250 | 1,250 | 1,250 | 1,250 | 1,250 | 8,750 |
| Unusable returns | 6 | 1 | 3 | 0 | 2 | 1 | 5 | 18 |
| Undeliverable | 157 | 136 | 170 | 149 | 157 | 120 | 124 | 1,013 |
| Returns (usable) | 539 | 455 | 479 | 463 | 436 | 361 | 465 | 3,192 |
| Response rate | 49.3 | 40.8 | 44.4 | 42.0 | 39.9 | 32.0 | 41.3 | 41.3 |

[1] Central Finger Lakes (CFL), Central New York (CNY), Eastern Lake Plains (ELP), Middle Lake Plains (MLP), Mohawk Valley (MV), Suffolk-Westchester (SW), Western Lake Plains (WLP)

### Nonresponse Bias Analysis

We present a comprehensive set of respondent-nonrespondent comparisons in Appendix B. We found a number of statistically-significant differences between respondents and nonrespondents. Key differences included the following:

- The proportion of men was higher in the respondent group (66% vs. 51%)
- The proportion of deer hunters was higher in the respondent group (27% vs. 18%)
- Respondents were more likely than nonrespondents to: (1) be concerned about deer damage to gardens (69% vs. 59%); (2) be concerned about deer damage to forests and native plants (67% vs. 50%); (3) report that they enjoy deer but worry about problems deer may cause (54% vs. 40%); and want the deer population to increase (21% vs. 11%)

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Some response patterns were similar for respondents and nonrespondents. For example, when asked about deer-related impacts both respondents and nonrespondents expressed the highest levels of concern about Lyme or other tick-borne diseases and deer-vehicle collisions. Majorities of both respondents and nonrespondents believed it was very or extremely important for DEC to consider tick-borne illnesses and deer-vehicle collisions when managing deer in their local area.

During preliminary analysis, we explored whether respondent-nonrespondent differences could be addressed in part by weighting to adjust the male-female ratio. We found that weighting the data based on gender had little effect on the key variable from the survey (i.e., deer population preference). Thus, the study contact team made a decision to not have us adjust the data based on gender. The results presented in this report have not been weighted to adjust for respondent-nonrespondent differences.

**Respondent Characteristics**

We provide a comprehensive set of results tables for all AWMUs at the end of the report (Appendix C). Mean age of respondents was 62 years. In all aggregates the majority of respondents were male (from 54% in Westchester-Suffolk to 67% in the Central Finger Lakes). Respondents were most likely to live in a rural area outside a village/hamlet (44%) or a village or hamlet (27%) (21% lived in a small city; 8% lived in a large city). The percentage who lived in a rural area ranged widely, from 13% in the Westchester-Suffolk AWMU to 66% in the Central Finger Lakes AWMU. These characteristics suggest that respondents are older, more likely to be male, and more likely to be rural than the state population as a whole.

**Deer Population Preferences**

The first objective of this study was to identify deer population preferences in specific AWMUs. We found that in all aggregates about a third of respondents (30% – 39%) desired no change in the local deer population (Table 4 – 5). In some aggregates (e.g., Middle Lake Plains, Suffolk-Westchester) the proportion of respondents who desired a decrease in deer population markedly exceeded the proportion who desired an increase in deer population. About a third of respondents reported that it was very or extremely important to them that the deer population level they preferred be attained within the next 5 years (Table 6).

**Variables Correlated with Deer Population Preference**

The second objective of our study was to improve understanding of factors influencing local residents' preferences for future deer population. In this study we used 2 complementary methods—correlational analysis and regression analysis—to measure strength of association between deer population preference and respondents' personal characteristics and deer-related attitudes, interests, concerns, and behaviors.

**Table 4.** How respondents preferred the deer population in their local area to change in the next 5 years (response options collapsed into 4 categories).

| | Aggregated wildlife management units (AWMUs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=506 | Central New York n=424 | Eastern Lake Plains n=434 | Middle Lake Plains n=424 | Mohawk Valley n=389 | Suffolk West-chester n=325 | Western Lake Plains n=417 | Total n=2919 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Decrease moderately or greatly | 31.4 | 37.5 | 23.3 | 42.2 | 26.2 | 46.6 | 34.1 | 34.3 |
| Stay about the same | 36.8 | 35.1 | 38.9 | 35.1 | 35.7 | 29.5 | 38.8 | 36.0 |
| Increase moderately or greatly | 24.9 | 17.0 | 30.9 | 13.0 | 27.0 | 7.7 | 19.7 | 20.5 |
| No preference | 6.9 | 10.4 | 6.9 | 9.7 | 11.1 | 14.2 | 7.4 | 9.2 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table 5.** How respondents preferred the deer population in their local area to change in the next 5 years.

| | Aggregated wildlife management units (AWMUs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=506 | Central New York n=424 | Eastern Lake Plains n=434 | Middle Lake Plains n=424 | Mohawk Valley n=389 | Suffolk West-chester n=325 | Western Lake Plains n=417 | Total n=2919 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Decrease greatly | 7.5 | 11.8 | 5.1 | 10.8 | 6.7 | 18.5 | 9.8 | 9.7 |
| Decrease moderately | 23.9 | 25.7 | 18.2 | 31.4 | 19.5 | 30.2 | 24.2 | 24.6 |
| Stay about the same | 36.8 | 35.1 | 38.9 | 35.1 | 35.7 | 29.5 | 38.8 | 36.0 |
| Increase moderately | 20.9 | 14.2 | 23.5 | 11.1 | 21.1 | 6.5 | 16.5 | 16.7 |
| Increase greatly | 4.0 | 2.8 | 7.4 | 1.9 | 5.9 | 1.2 | 3.1 | 3.8 |
| No preference | 6.9 | 10.4 | 6.9 | 9.7 | 11.1 | 14.2 | 7.4 | 9.2 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table 6.** Importance to respondents that the local deer population level change as they preferred over the next 5 years.

| | Aggregated wildlife management units (AWMUs) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=504 | Central New York n=422 | Eastern Lake Plains n=432 | Middle Lake Plains n=425 | Mohawk Valley n=388 | Suffolk West-chester n=322 | Western Lake Plains n=416 | Total n=2,909 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Not at all important | 11.9 | 14.9 | 10.2 | 13.6 | 13.4 | 14.3 | 10.8 | 12.7 |
| Slightly important | 19.4 | 23.2 | 22.5 | 18.6 | 20.9 | 22.4 | 23.8 | 21.5 |
| Moderately important | 35.5 | 30.6 | 33.6 | 39.1 | 36.1 | 27.3 | 34.6 | 34.1 |
| Very important | 23.2 | 22.0 | 23.6 | 20.9 | 19.3 | 24.2 | 21.2 | 22.1 |
| Extremely important | 9.9 | 9.2 | 10.2 | 7.8 | 10.3 | 11.8 | 9.6 | 9.8 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

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First, we used the chi square statistic to identify significant relationships between deer population preference and specific categorical variables. We found significant relationships between deer population preference and: deer-related interests, participation in deer hunting, deer-related concerns, personal importance of deer management, overall attitudes toward deer, and perceptions of the cost-benefit ratio associated with local deer.

### Interest in deer viewing

Over a third of respondents described themselves as very or extremely interested in deer viewing. Most respondents who had no interest in viewing deer preferred that the local deer population decrease or stay about the same level. Most respondents who had high interest in viewing deer preferred that the local deer population stay about the same level or increase. In the Central Finger Lakes AWMU, for example, 67% of respondents who had no interest in viewing deer wanted a deer population reduction, while over 85% of those who were very or extremely interested in viewing deer wanted the deer population to stay about the same level or increase (Table 7). In aggregates where relatively few respondents wanted a population increase, like the Middle Lake Plains AWMU, this pattern was not as pronounced.

**Table 7.** Differences in preference for future deer population across respondents with different levels of personal interest in deer viewing, for the Central Finger Lakes AWMU.

| Preference for future deer population in local area | Level of personal interest in viewing deer[1] | | | |
|---|---|---|---|---|
| | Not interested n=43 (%) | Slightly/ moderately interested n=249 (%) | Very/ extremely interested n=203 (%) | Total n=495 (%) |
| Decrease mod./greatly | 67.4 | 39.4 | 12.3 | 30.7 |
| Stay about the same | 14.0 | 37.3 | 42.3 | 37.4 |
| Increase mod./greatly | 7.0 | 13.3 | 43.8 | 25.3 |
| No preference | 11.6 | 10.0 | 1.5 | 6.7 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 |

[1]Chi square =116.692, df=6, $p < 0.001$

### Participation in deer hunting

Over a quarter (27%) of all respondents participated in deer hunting. The percentage of respondents who were deer hunters varied by aggregate, from 22 – 39%: Central Finger Lakes 35%, Central New York 22%, Eastern Lake Plains 39%, Middle Lake Plains 23%, Mohawk Valley 27%, Westchester-Suffolk 8%, Western Lake Plains 28%. Respondents who hunted deer were much more likely than nonhunting respondents to prefer a deer population increase.

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Nonhunters were more likely than hunters to prefer that the deer population decrease, or to have no deer population preference. For example, in the Western Lake Plains AWMU, 45.5% of hunters but only 9.8% of nonhunters preferred an increase in the local deer population; only 17.1% of hunters but 40.4% of nonhunters preferred a decrease in the local deer population.

About 45% of respondents (nonhunters and hunters combined) believed it was very or extremely important for DEC to consider deer hunting when managing local deer. Deer hunters were much more likely than nonhunters to believe it was very or extremely important for DEC to consider deer hunting when managing local deer (87% vs. 29%).

### Deer-related concerns

Respondents expressed the highest levels of concern about tick-borne diseases and deer-vehicle accidents (with two-thirds saying they were very or extremely concerned about those issues). Respondents (including both hunters and nonhunters) viewed human health and safety as high priorities for management attention. In every AWMU majorities of respondents believed it was very or extremely important for DEC to address tick-borne illnesses and deer-vehicle accidents. In every AWMU respondents were most likely to say that tick-borne diseases were one of the issues that should receive the most weight in determining the future deer population in their local area (and in most aggregates deer-related vehicle collisions was the issue that was second or third most likely to be selected). Respondents who had high levels of concern about tick-borne diseases or deer-vehicle collisions were more likely than those with low levels of concern to prefer a decrease in deer population size.

Smaller proportions of respondents expressed high concern about deer damage to gardens or farmers' crops. Depending upon the AWMU, only 22% – 33% of respondents were very or extremely concerned about deer damage to gardens or farmers' crops. In every AWMU, concern about damage to forests was relatively low (in 6 of 7 AWMUs, less than 20% of respondents were very or extremely concerned about deer damage to forests). Only 3% of respondents believed that deer damage to forests and natural plants was 1 of the 2 issues that should receive the most weight in deer population decisions. Nevertheless, respondents who had high levels of concern about negative impacts of deer damage to gardens, farmers' crops, or forests were more likely than those with low levels of such concern to prefer a decrease in deer population size.

We found strong correlations between all concerns about deer and deer population preference. High levels of concern about deer-related problems were strongly correlated with preferences for a decrease in local deer population. This relationship was observed for all specific concerns (i.e., health, safety, or deer browsing concerns) and in all AWMUs. Table 8 shows how this relationship was expressed for concern about deer damage to gardens in the Central New York AWMU.

### Salience of deer management

We found that deer population preference varied when respondents were grouped based on how salient deer management was for each respondent. Respondents who reported that the issue of deer management was very or extremely important were more likely than other respondents to

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desire a deer population change, whether that be an increase or a decrease (see illustration in Table 9). Similarly, respondents who reported that it was very or extremely important to them that their preferred deer population level was achieved were more likely than other respondents to desire a deer population change, whether that be an increase or a decrease (see illustration in Table 10).

### Perceived change in the deer population

We found a strong relationship between perceived change in the deer population and deer population preference. Aggregates where substantial portions of respondents perceived a deer population increase also had a substantial proportion of respondents who preferred a reduction in deer population in their area. For example, in the Suffolk-Westchester aggregate about 48% of respondents believed that their local deer population had increased in the previous 5 years, and 47% of respondents in that area preferred that the deer population in their area decrease in the future. In that AWMU, 72% of respondents who thought their local deer population had increased over the previous 5 years also preferred a deer population decrease in their area over the next 5 years.

**Table 8.** Differences in preference for future deer population across respondents with different levels of concern about deer damage to gardens, for the Central New York AWMU.

| Preference for future deer population in local area | Level of concern about deer damage to gardens[1] | | | |
|---|---|---|---|---|
| | Not concerned n=143 | Slightly/ moderately concerned n=174 | Very/ extremely concerned n=99 | Total n=416 |
| | (%) | (%) | (%) | (%) |
| Decrease mod./greatly | 11.9 | 36.8 | 75.8 | 37.5 |
| Stay about the same | 43.4 | 39.1 | 15.2 | 34.9 |
| Increase mod./greatly | 29.4 | 13.8 | 5.1 | 17.1 |
| No preference | 15.4 | 10.3 | 4.0 | 10.6 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 |

[1]Chi square =107.847, df=6, $p < 0.001$

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**Table 9.** Differences in preference for future deer population across respondents who placed different levels of importance on the issue of deer management, for the Eastern Lake Plains AWMU.

| Preference for future deer population in local area | Importance placed on the issue of deer management[1] | | | |
|---|---|---|---|---|
| | Not important n=28 | Slightly / moderately important n=201 | Very / extremely important n=186 | Total n=415 |
| | (%) | (%) | (%) | (%) |
| Decrease mod./greatly | 3.6 | 19.4 | 29.6 | 22.9 |
| Stay about the same | 35.7 | 48.8 | 28.0 | 38.6 |
| Increase mod./greatly | 14.3 | 24.9 | 40.9 | 31.3 |
| No preference | 46.4 | 7.0 | 1.6 | 7.2 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 |

[1]Chi square =98.476, df=6, $p < 0.001$

**Table 10.** Differences in preferences for future deer population level across respondents who placed different levels of importance on attaining their deer population preference, for the Mohawk Valley AWMU.

| Preference for future deer population in local area | Importance to respondent that preferred deer population level is attained[1] | | | |
|---|---|---|---|---|
| | Not important n=52 | Slightly / moderately important n=221 | Very / extremely important n=115 | Total n=388 |
| | (%) | (%) | (%) | (%) |
| Decrease mod./greatly | 5.8 | 24.4 | 39.1 | 26.3 |
| Stay about the same | 32.7 | 45.7 | 18.3 | 35.8 |
| Increase mod./greatly | 3.8 | 24.9 | 41.7 | 27.1 |
| No preference | 57.7 | 5.0 | 0.9 | 10.8 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 |

[1]Chi square =174.82 df=6, $p < 0.001$

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### Overall attitude toward deer

Overall attitude toward deer presence and deer population preference were significantly correlated. Respondents who enjoyed deer without worry were more likely than other respondents to prefer a deer population increase. Those who worried about deer-related problems, or regarded deer as a nuisance were more likely than others to prefer a deer population decrease. This pattern is illustrated below with data from the Mohawk Valley AWMU (Table 11).

### Perceived cost-benefit ratio associated with local deer

Perception of cost/benefit ratio of deer was correlated with deer population preference. Respondents who believed the benefits of deer outweighed the costs were more likely than other respondents to prefer a deer population increase. Those who believed costs outweighed benefits were more likely than other respondents to want the deer population to go down or stay about the same level. For example, in the Western Lake Plains AWMU, nearly 90% of those who thought the benefits of deer outweighed the costs preferred that the local deer population stay the same or increase. Conversely, 87% of those who thought the costs of deer outweighed the benefits preferred a deer population reduction (Table 12).

**Table 11.** Preference for future deer population by attitude toward local deer, for the Mohawk Valley AWMU.

| Preference for future deer population in local area | Attitude toward local deer[1] | | | | |
|---|---|---|---|---|---|
| | Enjoy deer, do not worry about problems n=151 | Enjoy deer, but worry about problems n=197 | Do not enjoy deer, regard them as a nuisance n=15 | No particular feelings toward deer n=25 | Total n=388 |
| | (%) | (%) | (%) | (%) | (%) |
| Decrease mod./greatly | 4.6 | 39.6 | 86.7 | 16.0 | 26.3 |
| Stay about the same | 44.4 | 32.5 | 13.3 | 24.0 | 35.8 |
| Increase mod./greatly | 45.0 | 17.8 | 0.0 | 8.0 | 27.1 |
| No preference | 6.0 | 10.2 | 0.0 | 52.0 | 10.8 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

[1]Chi square =144.678, df=9, $p < 0.001$

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**Table 12.** Differences in preference for future deer population across respondents who perceived a different balance of deer-related costs and benefits, for the Western Lake Plains AWMU.

| Preference for future deer population in local area | Benefits of deer outweigh problems<br><br>n=103 | Benefits and problems are about an even tradeoff<br>n=200 | Problems deer cause outweigh benefits of deer<br>n=110 | Total<br>n=413 |
|---|---|---|---|---|
| | (%) | (%) | (%) | (%) |
| Decrease mod./greatly | 6.8 | 19.5 | 87.3 | 34.4 |
| Stay about the same | 46.6 | 50.0 | 10.9 | 38.7 |
| Increase mod./greatly | 42.7 | 17.0 | 1.8 | 19.4 |
| No preference | 3.9 | 13.5 | 0.0 | 7.5 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 |

[1]Chi square =222.051, df=6, $p < 0.001$

**Factors that Explain Deer Population Preference**

Correlational statistics (e.g., the chi square statistic, Pearson's correlation coefficient) provide an expedient way to identify associations between pairs of variables in SPSS, and are useful to identify potential independent variables to include in multivariate analyses. But correlation analysis does not allow the researcher to consider potential confounding effects or effect modifiers. Regression analysis makes it possible to measure the strength of association between multiple independent variables (e.g., deer-related interests and concerns) and a dependent variable (e.g., deer population preference) adjusting for potential confounding effects. So to go beyond the insights provided by chi square comparisons above, we conducted logistic regression analyses to identify factors that explain a preference for a decrease or increase in local deer population.

We found that 3 concerns about deer had a Pearson correlation with each other of 0.6 or above (Table 13), so those variables were combined into 1 variable labeled "BROWSE CON". We found that interest in hunting, participation in hiking, age, and urban-rural setting were not significant predictors in models for any AWMU, so those variables were dropped before final analyses were conducted. In this analysis we excluded data from respondents who failed to provide valid responses on all predictor variables. That resulted in a loss of 15% to 22% of useable returns depending on the AWMU. All model results (i.e., including non-significant findings) in each AWMU are reported in Appendix D (dependent variable: preference for a deer population decrease) and Appendix E (dependent variable: preference for a deer population increase).

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**Table 13.** Pearson correlations between items measuring deer-related interests and concerns.

| | Interest: deer viewing | Interest: deer hunting | Concern: Garden damage | Concern: Crop damage | Concern: Forest, native plant damage | Concern: tick-borne diseases | Concern: Deer-vehicle collisions |
|---|---|---|---|---|---|---|---|
| Interest: Deer viewing | — | | | | | | |
| Interest: Deer hunting | 0.350** | — | | | | | |
| Concern: Garden damage | -0.223** | -0.052** | — | | | | |
| Concern: Crop damage | -0.169** | 0.049** | 0.662** | — | | | |
| Concern: Forest, native plant damage | -0.169** | 0.025 | 0.611** | 0.680** | — | | |
| Concern: Tick-borne diseases | -0.052** | 0.083** | 0.412** | 0.466** | 0.483** | — | |
| Concern: Deer-vehicle collisions | -0.169** | -0.096** | 0.474** | 0.490** | 0.459** | 0.558** | — |

**Correlation is significant at the 0.01 level (2-tailed)

### Preference for a deer population decrease

Depending on the AWMU, the models were able to correctly classify 77% – 85% of cases. Cox & Snell $R^2$ values and Nagelkerke $R^2$ values suggest that the models were able to explain somewhere between 32% and 59% of the variance in preference for a deer population decrease (Appendix D). Eight factors were significant predictors of preference for a deer population decrease in 1 or more AWMUs. In any given AWMU, as few as 3 and as many as 6 variables were significant predictors (Table 14).

Deer-related interests. Interest in deer viewing was a significant predictor variable in every AWMU, and was negatively correlated with preference for a deer population decrease. The odds ratio [*Exp(B)*] results indicated that the probability of preferring a reduced deer population decreased as level of interest in deer viewing increased.

Deer-related concerns. Concern about deer browsing damage (i.e., the aggregate variable that combined concern about damage to garden plants, farmers crops, or forests into a single variable) was a significant predictor variable in every AWMU, and was positively correlated with preference for a deer population decrease. The odds ratio [*Exp(B)*] results indicated that respondents who were highly concerned about browsing damage were twice as likely to prefer a deer population decrease compared with those who were least concerned.

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Concern about Lyme and other tick-borne diseases was a significant predictor variable in 3 AWMUs, and was positively correlated with preference for a deer population decrease. The odds ratio [*Exp(B)*] results indicated that as level of concern about tick-borne diseases increased, so did the odds of preferring a deer population decrease.

Concern about deer-vehicle collisions was a significant predictor variable in 5 AWMUs, and was positively correlated with preference for a deer population decrease. The odds ratio [*Exp(B)*] results indicated that in some AWMUs respondents who were highly concerned about deer-vehicle collisions were 2 or 3 times as likely to prefer a deer population decrease compared with those who were least concerned about deer-vehicle collisions.

Gender. In the Suffolk-Westchester AWMU, gender was a significant predictor variable. Being male increased the likelihood of a preference for a deer population decrease.

Activity involvement. In the Central Finger Lakes AWMU, participation in farming and managing forests/woodlots were both significant predictor variables. The probability of preferring a deer population decrease was higher for farmers than nonfarmers. Conversely, managing woodlots was associated with a lower probability of preferring a deer population decline.

In 3 AWMUs, driving in areas with many deer was a predictor variable. The odds ratio [*Exp(B)*] results indicated that in some AWMUs respondents who drove a vehicle in areas "with lots of deer" were 3 or 4 times as likely to prefer a deer population decrease compared with those who did not operate a vehicle in such areas.

**Preference for a deer population increase**

Depending on the AWMU, the models were able to correctly classify 81% – 87% of cases, and explain somewhere between 10% and 51% of the variance in preference for a deer population increase (Appendix E). In any given AWMU, as few as 1 and as many as 4 variables were significant predictors (Table 15).

Deer-related interests. In all AWMUs, high interest in deer viewing was predictive of, and positively correlated with, preference for a deer population increase. High interest in deer hunting was predictive of, and positively correlated with preference for a deer population increase in 4 AWMUs. The odds ratio [*Exp(B)*] results indicated that the probability of preferring an increased deer population increased as level of interest in deer viewing or hunting increased.

Deer-related concerns. Concern about deer browsing damage (damage to garden plants, farmers crops, or forests) was a significant predictor variable in 4 AWMUs, concern about deer-vehicle collisions was predictive in 3 AWMUs, and concern about tick-borne illnesses was predictive in 1 AWMU. In all instances, concerns were negatively correlated with preference for a deer population increase. The odds ratio [*Exp(B)*] results indicated that as level of concern about negative deer-related impacts decreased, the odds of preferring a higher deer population increased. In the Middle Lake Plains AWMU, the odds of preferring a deer population increase were higher for respondents who reported they did not drive in areas with lots of deer.

**Table 14.** Summary of logistic regression analysis for variables predicting preference for a deer population decrease (yes/no) in each AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | |
|---|---|---|---|---|---|---|---|
| | Central Finger Lakes (n=459) *B* | Central New York (n=380) *B* | Eastern Lake Plains (n=402) *B* | Middle Lake Plains (n=382) *B* | Mohawk Valley (n346) *B* | Suffolk Westchester (n=280) *B* | Western Lake Plains (n=377) *B* |
| Interest: deer viewing | -0.856*** | -0.787*** | -0.713*** | -0.691*** | -.561*** | -0.619*** | -0.771*** |
| Concern about browsing damage (to crops, gardens, or forests) | 0.810*** | 0.759*** | 0.808*** | 0.816*** | .679*** | 0.889*** | 0.671** |
| Concern: tick-borne diseases | 0.370** | 0.523** | | | | 0.489* | |
| Concern: deer-vehicle collisions | 0.831*** | | 0.603*** | 0.841*** | 1.135*** | | 0.514** |
| Gender: (male) | | | | | | 1.094** | |
| Activities: Farm (group: do not) | 0.887*** | | | | | | |
| Activities: Manage forest land (group: do not) | -1.063** | | | | | | |
| Activities: Drive in areas with lots of deer (group: do not) | 1.354*** | | | 1.226*** | | 1.531*** | |

*p< .05; **p< .01; ***p< .001

**Table 15.** Summary of logistic regression analysis for variables predicting preference for a deer population increase (yes/no) in each AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | |
|---|---|---|---|---|---|---|---|
| | Central Finger Lakes (n=459) *B* | Central New York (n=380) *B* | Eastern Lake Plains (n=402) *B* | Middle Lake Plains (n=382) *B* | Mohawk Valley (n346) *B* | Suffolk Westchester (n=280) *B* | Western Lake Plains (n=377) *B* |
| Interest: deer viewing | 0.562*** | 0.504** | 0.292* | 0.589** | 0.627*** | 0.753** | 0.346* |
| Interest: deer hunting | 0.422** | 0.468* | 0.825*** | | | | 0.551** |
| Concern about browsing damage (to crops, gardens, or forests) | -0.713*** | | -0.391* | -0.681** | -0.508* | | -0.817*** |
| Concern: tick-borne diseases | | | | | 0.396* | | |
| Concern: deer-vehicle collisions | -0.283* | | -0.360* | | -0.614*** | | |
| Gender: (male) | | | | -1.199 | | | |
| Activities: Drive in areas with lots of deer (group: do not) | | | | 0.933* | | | |

*p< .05; **p< .01; ***p< .001

## DISCUSSION

We used data from the 2018 survey of property owners in 7 AWMUs to identify predictors of a preference for a decrease or an increase in local deer population. We found that interest in deer viewing or hunting, and concerns about deer-related problems (i.e., browsing damage to gardens, farmers' crops, or forests), were predictive of deer population preference.

The relationships we observed between deer population preference and deer-related interests and concerns are consistent with previous research with general audiences (e.g., property owners, suburban residents) (Decker and Gavin 1987, Siemer et al. 2015). Our findings are also consistent with previous research on specific stakeholder groups (e.g., farmers, orchardists) (Brown and Decker 1979, Brown et al. 1978, Decker and Brown 1982, Decker et al. 1981). Although the proportions of residents who wanted more or fewer deer varied by AWMU, we observed similar relationships across aggregates with regard to relationships between deer population preference or deer-related attitude, and deer-related concerns or interests. These findings increase confidence that relationships observed are not just confined to a specific geographic location.

Based on previous studies, including the pilot survey completed as the precursor to this study (Siemer et al. 2015), we anticipated that concern about tick-borne diseases would be a predictor variable in most AWMUs, but we found that it was only a significant predictor variable in 3 of the 7 AWMUs surveyed. That finding may be explained by the fact that most respondents were very or extremely concerned about tick-borne illnesses. In AWMUs where high concern about such illnesses was ubiquitous, it did not serve as a trait that distinguished between respondents with different deer population preferences.

## CONCLUSIONS

The relationships we found between deer-related interests, deer-related concerns, and deer population preference have been demonstrated previously by observing relationships between overall attitude toward deer, or perceived benefits and costs of having deer in a region, and deer-related interests and concerns. Findings from this study suggest that deer population preference, overall attitude toward deer, and perceived benefit-cost ratio of deer presence can all be used as dependent variables by researchers interested in understanding the factors that predict tolerance for deer. All 3 measures (i.e., overall attitude toward deer, perceived cost-benefit ratio of deer presence, and deer population preference) yield insights about the degree to which tolerance for deer has been exceeded for a given population of residents or stakeholder group. We contend that all 3 variables yield similar insights about tolerance for deer because they are all tapping into the underlying concept of perceived impacts of deer, as described by Riley et al. (2002) and Lischka et al. (2008).

It is noteworthy that in every AWMU respondents expressed relatively low levels of concern about deer damaging forests through excessive browsing and were unlikely to regard damage to forests as a top priority for deer management. Given its importance to DEC as a consideration in setting deer population objectives, forest health and tree regeneration are topics that may warrant greater attention in communication from DEC to deer management stakeholders.

Our findings that many property owners residing in the AWMUs were highly concerned about tick-borne diseases and deer-vehicle collisions were not surprising, given that these concerns have appeared consistently in recent surveys in New York State. Given the level of public concern about these health and safety impacts, it will be important for DEC to communicate how deer population management does and does not address the incidence of deer-vehicle collisions and tick-borne illness across the state.

**Study Limitations**

We sampled from the population of property owners in New York State. We used that sampling approach because it allows the researcher to identify and deliver mail directly to specific individuals and households. The mix of deer-related interests and concerns may differ in other populations (e.g., New York State residents who do not own residential property), so the proportion of residents who prefer a deer population increase or decrease may also differ from what was observed in this study. We did not use listed household sampling—the main alternative sampling approach—because it has limitations that make it less favorable in this context (i.e., it does not allow the researcher to identify all individuals, it excludes individuals who do not have a publicly-listed telephone number [i.e., a land line]).

The proportion of respondents who hunted deer was high in several AWMUs. It ranged from 8% to 39% hunters by AWMU; the rate of hunting among all adult New York State residents is estimated to be <10% (USDI 2014). We believe that hunters responded at a higher rate than nonhunters because the topic of the survey is more salient to hunters. We have observed this pattern repeatedly in past deer management surveys. Overrepresentation of hunters is a recurring challenge for agencies seeking to engage stakeholders in deer management decisions. Overrepresentation of hunters was a prominent challenge in the pilot study that proceeded this survey (Pomeranz et al. 2017).

The strength of our study approach was that it provided a useful snapshot of property owners generally. But this approach does not provide detailed profiles of specific stakeholder groups that may be important to consider in a given AWMU. For example, there may be AWMUs where managers want a deeper understanding of acceptance capacity for deer within specific agricultural production groups (e.g., row crop producers, orchardists). Managers would need to design targeted studies or monitoring processes to obtain detailed characterizations of specific stakeholder groups.

**Next Steps**

Analysis of data from this survey was provided to DEC in summer 2018. This survey will be repeated in 2019 and beyond until the same data have been collected in all AWMUs. DEC personnel will use the data from these surveys, along with other information, to determine deer population goals in each AWMU.

Replication of the 2018 survey in additional AWMUs represents an opportunity to continue examining the factors that predict tolerance for deer at the AWMU level. The relationships identified in the 2018 study could be refined and expanded by repeating the same type of

analyses in additional AWMUs, or by applying alternative analysis approaches (e.g., multinomial logistic regression, linear regression, structural equation modeling).

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**APPENDIX A (Example Survey Instrument)**

# **Deer in the Mohawk Valley:**
# Residents' Interests and Concerns

Research conducted for the
NYS Department of Environmental Conservation
Division of Fish and Wildlife

by the
Human Dimensions Research Unit
Department of Natural Resources, Cornell University

The New York State Department of Environmental Conservation (DEC) is sponsoring this survey to learn more about residents' interests and concerns regarding deer and deer management in a portion of the Mohawk Valley, shown as the shaded part of the map on the following page. DEC will use the information that you and other residents provide in this survey to help set deer population goals in the Mohawk Valley Aggregated Wildlife Management Unit.

We would like input from EVERYONE who receives this questionnaire, not just those who have strong opinions about deer. We want the results of the survey to reflect the perspectives of all area residents.

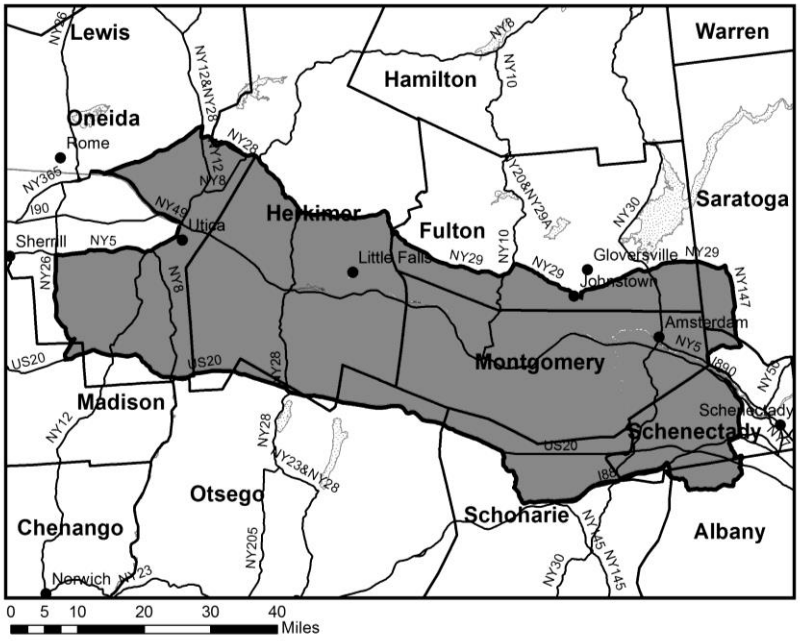
Please complete this questionnaire as soon as you can, seal it with the white re-sealable label provided, and drop it in any mailbox; ***return postage has been pre-paid***. Your identity will be kept confidential and the information you give us will never be associated with your name.

**THANK YOU FOR YOUR HELP!**

# THE MOHAWK VALLEY
# AGGREGATED WILDLIFE MANAGEMENT UNIT

DEC has created 24 aggregated wildlife management units for the purpose of setting local deer population goals.

You are a resident of the shaded area of the map below (i.e., the Mohawk Valley Aggregated Wildlife Management Unit). It encompasses parts of Albany, Fulton, Madison, Oneida, Otsego, Herkimer, Montgomery, Saratoga, Schenectady, and
Schoharie counties.




Note: **All questions in this questionnaire refer to your deer-related experiences and opinions <u>in the shaded area indicated on the map above</u>.**

## YOUR VIEWS ABOUT DEER

1. **Over the last 12 months, how often have you discussed <u>deer</u> with your friends or family?** *(Circle one number.)*

   1 Never
   2 Seldom
   3 Occasionally
   4 Fairly often
   5 Very often

2. **How important is the issue of <u>deer management</u> to you personally?** *(Circle one number.)*

   1 Not at all important to me
   2 Slightly important
   3 Moderately important
   4 Very important
   5 Extremely important

3. **In your opinion, is the deer population in your area (*refer to map on previous page*) too large, about the right size, or too small?** *(Circle one number.)*

   1 Too large
   2 About the right size
   3 Too small
   4 No opinion

4. **Below are two interests you may have related to deer. Please indicate how interested <u>you</u> are in each in your area.** *(Circle one number for each interest.)*

| | Not at all interested | Slightly interested | Moderately interested | Very interested | Extremely interested |
|---|---|---|---|---|---|
| a. Deer viewing | 1 | 2 | 3 | 4 | 5 |
| b. Deer hunting | 1 | 2 | 3 | 4 | 5 |

**5. Below is a list of concerns you may have related to deer. Please indicate how concerned <u>you</u> are about each in your area.** *(Circle one number for each concern.)*

| | Not at all concerned | Slightly concerned | Moderately concerned | Very concerned | Extremely concerned |
|---|---|---|---|---|---|
| a. Deer damage to gardens and plantings around homes | 1 | 2 | 3 | 4 | 5 |
| b. Crop losses experienced by local farmers due to deer | 1 | 2 | 3 | 4 | 5 |
| c. Deer damage to forests and native plants | 1 | 2 | 3 | 4 | 5 |
| d. Lyme or other tick-borne diseases | 1 | 2 | 3 | 4 | 5 |
| e. Deer-vehicle collisions | 1 | 2 | 3 | 4 | 5 |

**6. How important is it to you <u>that DEC considers</u> the following deer-related interests and concerns when managing deer in <u>your area</u>?** *(Circle one number for each item.)*

| | Not at all important | Slightly important | Moderately important | Very important | Extremely important |
|---|---|---|---|---|---|
| a. Deer viewing | 1 | 2 | 3 | 4 | 5 |
| b. Deer hunting | 1 | 2 | 3 | 4 | 5 |
| c. Deer damage to gardens and plantings around homes | 1 | 2 | 3 | 4 | 5 |
| d. Crop losses experienced by local farmers due to deer | 1 | 2 | 3 | 4 | 5 |
| e. Deer damage to forests and native plants | 1 | 2 | 3 | 4 | 5 |
| f. Lyme or other tick-borne diseases | 1 | 2 | 3 | 4 | 5 |
| g. Deer-vehicle collisions | 1 | 2 | 3 | 4 | 5 |

**7. In your opinion, which <u>two</u> of the following factors should be given the <u>most weight</u> in determining the future deer population level in your area?**
*(Circle **<u>TWO</u>** numbers from the list below.)*

1 Deer viewing
2 Deer hunting
3 Deer damage to gardens and plantings around homes
4 Crop losses experienced by local farmers due to deer
5 Deer damage to forests and native plants
6 Lyme and other tick-borne diseases
7 Deer-vehicle collisions
8 Physical condition of deer (nutrition and disease status)

**8. Generally, how do you feel about deer in your area?**
*(Circle one number.)*

1 I enjoy deer and I <u>do not worry</u> about problems deer may cause
2 I enjoy deer but I <u>worry</u> about problems deer may cause
3 I do <u>not</u> enjoy deer and I regard them as a nuisance
4 I have no particular feelings about deer

**9. When you think about living with deer at their current population level, how would you weigh the benefits of deer against the problems deer cause <u>in your area</u>?**
*(Circle one number.)*

1 The <u>benefits</u> of deer <u>outweigh the problems</u> they cause
2 The <u>problems</u> deer cause <u>outweigh the benefits</u> of deer
3 The benefits of deer and the problems deer cause are about an <u>even trade off</u>

## YOUR DEER POPULATION PREFERENCE

**10. To your knowledge, how has the deer population in your area changed over the last 5 years?**
*(Circle one number.)*

1 Decreased greatly
2 Decreased moderately
3 Stayed about the same
4 Increased moderately
5 Increased greatly
6 Not sure

**11. How would you prefer the deer population in your area to change in the next 5 years?**
*(Circle one number.)*

1 Decrease greatly
2 Decrease moderately
3 Stay about the same
4 Increase moderately
5 Increase greatly
6 No preference

**12. How important is it to you that the deer population level in your area change over the next 5 years as you indicated in Question #11 above?** *(Circle one number.)*

1 Not at all important to me
2 Slightly important
3 Moderately important
4 Very important
5 Extremely important

## BACKGROUND INFORMATION

**13. What is your gender?** *(Circle one number.)*

1 Female
2 Male
3 Prefer not to say
4 Prefer to self-describe: _____

**14. In what year were you born?** *(Fill in the year.)* __ __ __ __

**15. Which category best describes the place where you currently reside for most of the year?** *(Circle one number.)*

1 A rural area, outside a village or hamlet
2 Village or hamlet (less than 10,000 people)
3 Small city (10,000 to 50,000 people)
4 Large city (over 50,000)

**16. Which of the following activities do you participate in?** *(Circle all that apply.)*

1 Gardening
2 Farming
3 Managing woodlots or forested land
4 Deer hunting
5 Driving in areas with lots of deer
6 Hiking/walking in natural areas
7 None of these describe me

****END OF SURVEY****

## APPENDIX B (Respondent – Nonrespondent Comparisons)

**Table B1.** Outcome of contacts with nonrespondents by staff at the Cornell Survey Research Institute (SRI).

| | Wildlife Management Unit Aggregate | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (CLP) | (CNY) | (ELP) | (MLP) | (MV) | (S-W) | (WLP) | Total |
| Interview completed | 50 | 50 | 50 | 50 | 50 | 50 | 50 | 350 |
| Interview refused | 1 | 4 | 6 | 10 | 2 | 3 | 5 | 31 |
| Pending (answering machine, callback appointment, no answer) | 88 | 111 | 108 | 156 | 120 | 119 | 169 | 871 |
| Ill/Deceased | 0 | 1 | 0 | 0 | 0 | 0 | 3 | 4 |
| Language problem | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 |
| Non-working number | 79 | 71 | 82 | 133 | 67 | 68 | 134 | 634 |
| Mail survey returned | 4 | 1 | 1 | 0 | 0 | 1 | 2 | 9 |
| Wrong number / Ineligible | 8 | 12 | 5 | 10 | 12 | 9 | 12 | 68 |
| Total | 230 | 250 | 252 | 360 | 251 | 250 | 375 | 1968 |

**Table B2.** Comparison of respondents to nonrespondents on gender, 2018 survey of residents in 7 WMU aggregates.

| | Respondents<br>(n)<br>% | Nonrespondents[a]<br>(n)<br>% |
|---|---|---|
| Male | (2,026)<br>66.2 | (180)<br>51.4 |
| Female | (1,035)<br>33.8 | (170)<br>48.6 |
| Total | (3,061) | (350) |

[a]chi square= 29.94, df=1, p<0.001

**Table B3.** Comparison of respondents to nonrespondents on participation in hunting, 2018 survey of residents in 7 WMU aggregates.

| | Respondents<br>(n)<br>% | Nonrespondents[a]<br>(n)<br>% |
|---|---|---|
| Yes (hunter) | (850)<br>26.8 | (64)<br>18.3 |
| No (nonhunter) | (2,325)<br>73.2 | (286)<br>81.7 |
| Total | (3,175) | (350) |

[a]chi square= 11.82, df=1, p<0.001

**Table B4.** Comparison of respondents to nonrespondents on personal importance placed on deer management, 2018 survey of residents in 7 WMU aggregates.

| | Respondents<br>(n=)<br>% | Nonrespodents[a]<br>(n=)<br>(%) |
|---|---|---|
| Not at all important to me | (297)<br>9.6 | (59)<br>17.0 |
| Slightly/moderately important to me | (1533)<br>49.5 | (143)<br>41.0 |
| Very/extremely important to me | (1270)<br>41.0 | (146)<br>42.0 |
| Total | (3100)<br>100.0 | (348)<br>100.0 |

[a]chi square=21.04, df=2, p<0.001

**Table B5.** Comparison of interests in local deer among respondents and nonrespondents, 2018 survey of residents in 7 WMU aggregates.

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| Potential interests: | n | Mean[a] | Level of interest | | | | | Chi square | df | P |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Not at all interested | Slightly interested | Moderately interested | Very interested | Extremely interested | | | |
| Deer viewing | | | | | | | | | | |
| Respondents | 3114 | 3.09 | 13.0 | 18.8 | 29.4 | 23.4 | 15.4 | 44.26 | 4 | <0.001 |
| Nonrespondents | 350 | 3.05 | 22.9 | 12.9 | 22.6 | 19.4 | 22.3 | | | |
| Deer hunting | | | | | | | | | | |
| Respondents | 3167 | 2.18 | 57.1 | 8.3 | 9.1 | 10.3 | 15.2 | 16.23 | 4 | 0.002 |
| Nonrespondents | 350 | 1.92 | 67.7 | 5.1 | 7.7 | 6.6 | 12.9 | | | |

[a] 1=not at all interested, 2=slightly interested, 3=moderately interested, 4=very interested, 5=extremely interested

**Table B6.** Comparison of concerns about local deer among respondents and nonrespondents, 2018 survey of residents in 7 WMU aggregates.

| | | | Level of concern | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Potential concerns:** | n | Mean[a] | Not at all concerned | Slightly concerned | Moderately concerned | Very concerned | Extremely concerned | Chi square | df | P |
| Deer damage to gardens and plantings around homes | | | | | | | | | | |
| Respondents | 3148 | 2.47 | 31.3 | 24.8 | 19.9 | 13.4 | 10.5 | 21.47 | 4 | <0.001 |
| Nonrespondents | 350 | 2.37 | 41.4 | 16.9 | 18.0 | 11.1 | 12.6 | | | |
| Deer damage to forests and native plants | | | | | | | | | | |
| Respondents | 3131 | 2.36 | 32.9 | 24.2 | 23.7 | 12.6 | 6.5 | 45.91 | 4 | <0.001 |
| Nonrespondents | 349 | 2.12 | 49.6 | 14.9 | 17.5 | 9.7 | 8.3 | | | |
| Lyme or other tick-borne diseases | | | | | | | | | | |
| Respondents | 3146 | 3.88 | 5.2 | 9.3 | 18.4 | 26.4 | 40.6 | 20.17 | 4 | <0.001 |
| Nonrespondents | 349 | 3.84 | 10.3 | 6.3 | 14.6 | 26.6 | 42.1 | | | |
| Deer-vehicle collisions | | | | | | | | | | |
| Respondents | 3140 | 3.80 | 4.9 | 10.5 | 21.7 | 25.5 | 37.4 | 23.01 | 4 | <0.001 |
| Nonrespondents | 350 | 3.91 | 8.3 | 4.3 | 18.6 | 26.3 | 42.6 | | | |

[a] 1=not at all concerned, 2=slightly concerned, 3=moderately concerned, 4=very concerned, 5=extremely concerned

**Table B7.** Comparison of perceived importance of addressing deer-related concerns among respondents and nonrespondents, 2018 survey of residents in 7 WMU aggregates.

| Potential concerns: | n | Mean[a] | Importance of addressing concern: Not at all important | Slightly important | Moderately important | Very important | Extremely important | Chi square | df | P |
|---|---|---|---|---|---|---|---|---|---|---|
| Deer viewing | | | | | | | | | | |
| Respondents | 3129 | 2.74 | 20.7 | 24.2 | 27.0 | 16.6 | 11.4 | 26.12 | 4 | <0.001 |
| Nonrespondents | 347 | 2.78 | 26.8 | 14.7 | 28.5 | 13.5 | 16.4 | | | |
| Deer hunting | | | | | | | | | | |
| Respondents | 3133 | 3.07 | 25.0 | 10.9 | 19.1 | 22.3 | 22.7 | 11.66 | 4 | 0.020 |
| Nonrespondents | 348 | 3.29 | 20.4 | 7.8 | 22.4 | 21.3 | 28.2 | | | |
| Deer damage to gardens and plantings around homes | | | | | | | | | | |
| Respondents | 3140 | 2.72 | 20.8 | 25.4 | 26.7 | 15.3 | 11.9 | 38.43 | 4 | <0.001 |
| Nonrespondents | 349 | 2.81 | 26.9 | 14.3 | 28.9 | 10.9 | 18.9 | | | |
| Deer damage to forests and native plants | | | | | | | | | | |
| Respondents | 3118 | 2.68 | 23.6 | 22.8 | 25.8 | 17.5 | 10.4 | 30.47 | 4 | <0.001 |
| Nonrespondents | 350 | 2.76 | 28.9 | 14.0 | 26.3 | 13.7 | 17.1 | | | |
| Lyme or other tick-borne diseases | | | | | | | | | | |
| Respondents | 3139 | 4.07 | 4.2 | 6.8 | 14.8 | 25.5 | 48.6 | 15.55 | 4 | 0.003 |
| Nonrespondents | 350 | 4.14 | 6.0 | 3.1 | 16.3 | 20.0 | 54.6 | | | |
| Deer-vehicle collisions | | | | | | | | | | |
| Respondents | 3145 | 3.89 | 4.2 | 10.2 | 19.0 | 25.8 | 40.9 | | | |
| Nonrespondents | 350 | 3.99 | 7.4 | 3.7 | 18.0 | 24.6 | 46.3 | | | |

[a] 1=not at all important, 2=slightly important, 3=moderately important, 4=very important, 5=extremely important

**Table B8.** Comparison of respondents to nonrespondents on overall attitude toward deer in their area, 2018 survey of residents in 7 WMU aggregates.

| | Respondents<br>(n)<br>% | Nonrespondents[a]<br>(n)<br>% |
|---|---|---|
| I enjoy deer and do not worry about problems deer may cause | (995)<br>34.1 | (137)<br>39.3 |
| I enjoy deer but worry about problems deer may cause | (1576)<br>54.0 | (140)<br>40.1 |
| I do not enjoy deer and I regard them as a nuisance | (178)<br>6.1 | (23)<br>6.6 |
| I have no particular feelings about deer | (172)<br>5.9 | (49)<br>14.0 |
| Total | (2,921) | (349) |

[a]chi square=44.58, df=3, p<0.001

**Table B9.** Comparison of respondents to nonrespondents on balance of deer-related costs and benefits in their area, 2018 survey of residents in 7 WMU aggregates.

| | Respondents<br>(n=2,865)<br>% | Nonrespodents[a]<br>(n=345)<br>(%) |
|---|---|---|
| The benefits of deer in my local area exceed the costs | (694)<br>24.2 | (68)<br>19.7 |
| The costs of deer in my local area exceed the benefits | (788)<br>27.5 | (76)<br>22.0 |
| The costs and benefits of deer in my local area are about an even tradeoff | (1383)<br>48.3 | (201)<br>58.3 |
| Total | (2,865) | (345) |

[a]chi square=12.29, df=2, p=0.002

**Table B10.** Comparison of respondents to nonrespondents on local deer population preference, 2018 survey of residents in 7 WMU aggregates.

| Desired trend in local deer population in the next 5 years | Respondents (n=2,919) % | Nonrespondents[a] (n) % |
|---|---|---|
| Decrease moderately or greatly | (1,000) 34.3 | (103) 29.4 |
| Stay about the same | (1,050) 36.0 | (175) 50.0 |
| Increase moderately or greatly | (599) 20.5 | (39) 11.2 |
| No preference | (270) 9.2 | (33) 9.4 |
| Total | 100.0 | 100.0 |

[a]chi square=32.44, df=3, p<0.001

**Table B11.** Comparison of respondents to nonrespondents on perception of change in local deer population, 2018 survey of residents in 7 WMU aggregates.

| Perceived trend in local deer population in last 5 years | Respondents (n=2,919) % | Nonrespondents[a] (n) % |
|---|---|---|
| Decreased moderately or greatly | (628) 21.5 | (62) 17.8 |
| Stayed about the same | (845) 28.9 | (130) 37.2 |
| Increased moderately or greatly | (915) 31.3 | (115) 33.0 |
| Not sure | (534) 18.3 | (42) 12.0 |
| Total | 100.0 | 100.0 |

[a]chi square=16.47, df=3, p<0.001

## APPENDIX C (Summary of Survey Results by Aggregated Wildlife Management Unit)

**Table C1.** Frequency with which respondents discussed deer with friends or family, by AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=527 | Central New York n=445 | Eastern Lake Plains n=461 | Middle Lake Plains n=446 | Mohawk Valley n=422 | Suffolk West-chester n=349 | Western Lake Plains n=458 | Total n=3,108 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Never | 5.3 | 8.8 | 4.8 | 7.2 | 9.2 | 17.5 | 6.3 | 8.0 |
| Almost never | 13.1 | 18.7 | 15.0 | 13.5 | 14.2 | 19.2 | 15.7 | 15.4 |
| Sometimes | 37.6 | 37.5 | 34.7 | 39.2 | 31.5 | 34.7 | 34.9 | 35.8 |
| Fairly often | 28.5 | 21.3 | 26.7 | 25.3 | 27.7 | 15.2 | 24.0 | 24.5 |
| Very often | 15.6 | 13.7 | 18.9 | 14.8 | 17.3 | 13.5 | 19.0 | 16.2 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table C2.** Personal importance of deer management to respondents (response categories collapsed), by AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=524 | Central New York n=443 | Eastern Lake Plains n=457 | Middle Lake Plains n=447 | Mohawk Valley n=422 | Suffolk West-chester n=350 | Western Lake Plains n=457 | Total n=3,100 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Not important | 7.8 | 10.8 | 6.8 | 9.4 | 10.9 | 14.0 | 8.8 | 9.6 |
| Slightly or moderately important | 44.1 | 52.8 | 49.5 | 51.5 | 47.9 | 51.1 | 50.5 | 49.5 |
| Very or extremely important | 48.1 | 36.3 | 43.8 | 39.1 | 41.2 | 34.9 | 40.7 | 41.0 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table C3.** Perception of current deer population in their area, by AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=524 | Central New York n=444 | Eastern Lake Plains n=457 | Middle Lake Plains n=444 | Mohawk Valley n=418 | Suffolk West-chester n=345 | Western Lake Plains n=454 | Total n=3,086 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Too large | 26.9 | 32.4 | 21.7 | 36.9 | 22.2 | 40.3 | 29.1 | 29.6 |
| About the right size | 46.2 | 39.9 | 51.4 | 44.6 | 42.3 | 29.3 | 47.8 | 43.6 |
| Too small | 15.5 | 10.8 | 16.6 | 5.2 | 19.6 | 8.7 | 9.7 | 12.4 |
| No opinion | 11.5 | 16.9 | 10.3 | 13.3 | 15.8 | 21.7 | 13.4 | 14.4 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table C4.** How respondents thought the deer population in their local area had changed in the last 5 years (response options collapsed into 4 categories), by AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=507 | Central New York n=424 | Eastern Lake Plains n=434 | Middle Lake Plains n=425 | Mohawk Valley n=388 | Suffolk West-chester n=325 | Western Lake Plains n=419 | Total n=2922 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Decreased moderately or greatly | 30.4 | 18.9 | 30.9 | 14.6 | 21.9 | 9.5 | 19.6 | 21.5 |
| Stayed about the same | 31.4 | 26.9 | 32.3 | 28.5 | 28.9 | 20.3 | 31.7 | 28.9 |
| Increased moderately or greatly | 24.3 | 34.0 | 21.9 | 36.5 | 28.1 | 47.7 | 32.0 | 31.3 |
| Not sure | 14.0 | 20.3 | 15.0 | 20.5 | 21.1 | 22.5 | 16.7 | 18.3 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table C5.** How respondents thought the deer population in their local area had changed in the last 5 years, by AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=507 | Central New York n=424 | Eastern Lake Plains n=434 | Middle Lake Plains n=425 | Mohawk Valley n=388 | Suffolk West-chester n=325 | Western Lake Plains n=419 | Total n=2922 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Decreased greatly | 10.8 | 6.6 | 10.8 | 3.8 | 8.2 | 4.6 | 6.2 | 7.5 |
| Decreased moderately | 19.5 | 12.3 | 20.0 | 10.8 | 13.7 | 4.9 | 13.4 | 14.0 |
| Stayed about the same | 31.4 | 26.9 | 32.3 | 28.5 | 28.9 | 20.3 | 31.7 | 28.9 |
| Increased moderately | 17.6 | 21.5 | 15.7 | 24.5 | 19.6 | 29.5 | 23.4 | 21.3 |
| Increased greatly | 6.7 | 12.5 | 6.2 | 12.0 | 8.5 | 18.2 | 8.6 | 10.0 |
| Not sure | 14.0 | 20.3 | 15.0 | 20.5 | 21.1 | 22.5 | 16.7 | 18.3 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table C6.** Interest in deer viewing (response categories collapsed), by AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=528 | Central New York n=441 | Eastern Lake Plains n=470 | Middle Lake Plains n=454 | Mohawk Valley n=420 | Suffolk West-chester n=346 | Western Lake Plains n=455 | Total n=3,114 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Not interested | 8.7 | 17.9 | 7.4 | 15.2 | 10.0 | 23.4 | 11.9 | 13.0 |
| Slightly or moderately interested | 49.4 | 52.6 | 48.3 | 48.9 | 43.6 | 48.6 | 45.3 | 48.1 |
| Very or extremely interested | 41.9 | 29.5 | 44.3 | 35.9 | 46.4 | 28.0 | 42.9 | 38.8 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table C7.** Interest in deer hunting (response categories collapsed), by AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=523 | Central New York n=439 | Eastern Lake Plains n=465 | Middle Lake Plains n=444 | Mohawk Valley n=412 | Suffolk West-chester n=338 | Western Lake Plains n=446 | Total n=3,067 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Not interested | 45.9 | 64.2 | 46.2 | 60.6 | 55.6 | 77.8 | 56.7 | 57.1 |
| Slightly or moderately interested | 21.6 | 15.5 | 19.1 | 18.2 | 16.7 | 10.1 | 17.7 | 17.4 |
| Very or extremely interested | 32.5 | 20.3 | 34.6 | 21.2 | 27.7 | 12.1 | 25.6 | 25.5 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table C8.** Concern about deer damage to gardens and plantings around homes (response categories collapsed), by AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=534 | Central New York n=447 | Eastern Lake Plains n=475 | Middle Lake Plains n=458 | Mohawk Valley n=427 | Suffolk West-chester n=349 | Western Lake Plains n=458 | Total n=3,148 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Not concerned | 31.3 | 34.2 | 32.2 | 24.0 | 35.1 | 33.0 | 29.7 | 31.3 |
| Slightly or moderately concerned | 46.4 | 42.5 | 46.3 | 48.3 | 43.8 | 36.1 | 47.6 | 44.8 |
| Very or extremely concerned | 22.3 | 23.3 | 21.5 | 27.7 | 21.1 | 30.9 | 22.7 | 24.0 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table C9.** Concern about crop losses experienced by local farmers due to deer (response categories collapsed), by AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=532 | Central New York n=446 | Eastern Lake Plains n=474 | Middle Lake Plains n=456 | Mohawk Valley n=425 | Suffolk West-chester n=344 | Western Lake Plains n=454 | Total n=3,131 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Not concerned | 23.3 | 20.6 | 23.4 | 17.8 | 21.6 | 27.0 | 18.1 | 21.6 |
| Slightly or moderately concerned | 51.7 | 52.0 | 52.7 | 55.7 | 55.8 | 39.5 | 57.3 | 52.5 |
| Very or extremely concerned | 25.0 | 27.4 | 23.8 | 26.5 | 22.6 | 33.4 | 24.7 | 25.9 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table C10.** Concern about deer damage to forests and native plants (response categories collapsed), by AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=530 | Central New York n=447 | Eastern Lake Plains n=473 | Middle Lake Plains n=455 | Mohawk Valley n=424 | Suffolk West-chester n=346 | Western Lake Plains n=456 | Total n=3,131 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Not concerned | 35.5 | 34.0 | 32.3 | 32.1 | 34.2 | 26.0 | 34.2 | 32.9 |
| Slightly or moderately concerned | 45.8 | 46.1 | 50.1 | 48.6 | 50.5 | 44.8 | 49.3 | 47.9 |
| Very or extremely concerned | 18.7 | 19.9 | 17.5 | 19.3 | 15.3 | 29.2 | 16.4 | 19.2 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table C11.** Concern about Lyme or other tick-borne diseases (response categories collapsed), by AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=534 | Central New York n=446 | Eastern Lake Plains n=474 | Middle Lake Plains n=457 | Mohawk Valley n=428 | Suffolk West-chester n=349 | Western Lake Plains n=458 | Total n=3,146 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Not concerned | 4.9 | 4.9 | 5.1 | 6.3 | 4.0 | 5.2 | 6.1 | 5.2 |
| Slightly or moderately concerned | 30.9 | 24.2 | 24.3 | 33.5 | 24.1 | 20.9 | 34.1 | 27.7 |
| Very or extremely concerned | 64.2 | 70.9 | 70.7 | 60.2 | 72.0 | 73.9 | 59.8 | 67.0 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table C12.** Concern about deer-vehicle collisions (response categories collapsed), by AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=532 | Central New York n=444 | Eastern Lake Plains n=474 | Middle Lake Plains n=458 | Mohawk Valley n=425 | Suffolk West-chester n=347 | Western Lake Plains n=460 | Total n=3,140 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Not concerned | 4.3 | 5.9 | 4.4 | 3.5 | 5.9 | 6.6 | 4.1 | 4.9 |
| Slightly or moderately concerned | 38.0 | 32.9 | 31.6 | 27.7 | 32.0 | 28.8 | 32.6 | 32.2 |
| Very or extremely concerned | 57.7 | 61.3 | 63.9 | 68.8 | 62.1 | 64.6 | 63.3 | 62.9 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table C13.** Importance that DEC consider deer viewing when making local deer management decisions (response categories collapsed), by AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=531 | Central New York n=443 | Eastern Lake Plains n=473 | Middle Lake Plains n=457 | Mohawk Valley n=425 | Suffolk West-chester n=346 | Western Lake Plains n=454 | Total n=3,129 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Not important | 17.1 | 24.6 | 16.7 | 21.0 | 18.6 | 31.2% | 18.9 | 20.7 |
| Slightly or moderately important | 53.3 | 51.5 | 51.6 | 54.5 | 49.4 | 46.5 | 50.2 | 51.2 |
| Very or extremely important | 29.6 | 23.9 | 31.7 | 24.5 | 32.0 | 22.3 | 30.8 | 28.1 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table C14.** Importance that DEC consider deer hunting when making local deer management decisions (response categories collapsed), by AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=529 | Central New York n=445 | Eastern Lake Plains n=474 | Middle Lake Plains n=458 | Mohawk Valley n=427 | Suffolk West-chester n=343 | Western Lake Plains n=457 | Total n=3,133 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Not important | 17.4 | 30.6 | 17.3 | 25.5 | 23.7 | 41.4 | 24.7 | 25.0 |
| Slightly or moderately important | 30.6 | 29.0 | 31.9 | 34.7 | 29.3 | 23.3 | 29.3 | 30.0 |
| Very or extremely important | 52.0 | 40.4 | 50.8 | 39.7 | 47.1 | 35.3 | 46.0 | 45.0 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table C15.** Importance that DEC consider deer damage to gardens and plantings around homes when making local deer management decisions (response categories collapsed), by AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=531 | Central New York n=447 | Eastern Lake Plains n=473 | Middle Lake Plains n=457 | Mohawk Valley n=427 | Suffolk West-chester n=348 | Western Lake Plains n=457 | Total n=3,140 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Not important | 20.7 | 23.3 | 23.5 | 18.2 | 21.3 | 20.7 | 17.7 | 20.8 |
| Slightly or moderately important | 54.0 | 49.2 | 52.0 | 54.9 | 52.5 | 42.0 | 57.1 | 52.1 |
| Very or extremely important | 25.2 | 27.5 | 24.5 | 26.9 | 26.2 | 37.4 | 25.2 | 27.2 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table C16.** Importance that DEC consider crop losses experienced by local farmers when making local deer management decisions (response categories collapsed), by AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=529 | Central New York n=447 | Eastern Lake Plains n=474 | Middle Lake Plains n=455 | Mohawk Valley n=426 | Suffolk West-chester n=346 | Western Lake Plains n=454 | Total n=3,131 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Not important | 16.1 | 13.0 | 16.7 | 11.0 | 12.7 | 18.2 | 12.8 | 14.3 |
| Slightly or moderately important | 49.1 | 45.2 | 50.4 | 50.5 | 51.4 | 37.9 | 51.3 | 48.4 |
| Very or extremely important | 34.8 | 41.8 | 32.9 | 38.5 | 35.9 | 43.9 | 35.9 | 37.4 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table C17.** Importance that DEC consider deer damage to forests and native plants when making local deer management decisions (response categories collapsed), by AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=526 | Central New York n=443 | Eastern Lake Plains n=473 | Middle Lake Plains n=453 | Mohawk Valley n=423 | Suffolk West-chester n=343 | Western Lake Plains n=457 | Total n=3,118 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Not important | 24.5 | 26.0 | 26.4 | 24.3 | 22.0 | 18.7 | 21.9 | 23.6 |
| Slightly or moderately important | 50.4 | 42.9 | 48.6 | 47.5 | 51.3 | 43.4 | 54.3 | 48.6 |
| Very or extremely important | 25.1 | 31.2 | 24.9 | 28.3 | 26.7 | 37.9 | 23.9 | 27.8 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table C18.** Importance that DEC consider Lyme and other tick-borne diseases when making local deer management decisions (response categories collapsed), by AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=532 | Central New York n=446 | Eastern Lake Plains n=473 | Middle Lake Plains n=458 | Mohawk Valley n=424 | Suffolk West-chester n=348 | Western Lake Plains n=458 | Total n=3,139 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Not important | 4.3 | 4.7 | 4.0 | 5.5 | 2.6 | 4.6 | 3.9 | 4.2 |
| Slightly or moderately important | 25.8 | 17.9 | 20.1 | 25.5 | 19.1 | 15.2 | 25.5 | 21.7 |
| Very or extremely important | 69.9 | 77.4 | 75.9 | 69.0 | 78.3 | 80.2 | 70.5 | 74.1 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table C19.** Importance that DEC consider deer-vehicle collisions when making local deer management decisions (response categories collapsed), by AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=531 | Central New York n=446 | Eastern Lake Plains n=475 | Middle Lake Plains n=460 | Mohawk Valley n=423 | Suffolk West-chester n=349 | Western Lake Plains n=461 | Total n=3,145 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Not important | 3.8 | 5.6 | 4.4 | 3.5 | 4.5 | 5.7 | 2.2 | 4.2 |
| Slightly or moderately important | 35.8 | 26.9 | 31.4 | 24.6 | 29.8 | 24.9 | 28.6 | 29.2 |
| Very or extremely important | 60.5 | 67.5 | 64.2 | 72.0 | 65.7 | 69.3 | 69.2 | 66.7 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table C20.** Respondents' beliefs about the two factors that DEC should give greatest weight in determining future deer population level, by AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=505 | Central New York n=423 | Eastern Lake Plains n=431 | Middle Lake Plains n=425 | Mohawk Valley n=388 | Suffolk West-chester n=322 | Western Lake Plains n=417 | Total n=2911 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Lyme and other tick-borne diseases | 51.5 | 71.2 | 57.8 | 51.8 | 60.3 | 74.8 | 48.0 | 58.6 |
| Deer-related vehicle accidents | 41.4 | 44.7 | 41.1 | 54.6 | 35.8 | 46.0 | 52.3 | 45.1 |
| Physical condition of deer | 38.0 | 33.8 | 38.7 | 35.3 | 41.2 | 28.6 | 36.7 | 36.3 |
| Deer hunting | 29.9 | 18.4 | 32.9 | 20.0 | 28.9 | 6.8 | 29.3 | 24.5 |
| Crop losses local farmers experience due to deer | 13.9 | 11.8 | 10.0 | 11.8 | 11.1 | 10.2 | 12.0 | 11.6 |
| Deer viewing | 12.7 | 7.3 | 11.4 | 10.4 | 11.3 | 8.1 | 9.4 | 10.2 |
| Garden damage | 6.7 | 10.2 | 5.1 | 11.1 | 5.7 | 18.0 | 8.4 | 9.0 |
| Damage to forests and native plants | 4.6 | 1.9 | 2.6 | 3.5 | 3.1 | 5.6 | 2.6 | 3.3 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table C21.** General attitude toward deer, by AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=508 | Central New York n=423 | Eastern Lake Plains n=434 | Middle Lake Plains n=425 | Mohawk Valley n=388 | Suffolk West-chester n=324 | Western Lake Plains n=419 | Total n=2,921 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Enjoy deer and do not worry about problems Deer may cause | 34.6 | 33.1 | 40.6 | 31.5 | 38.9 | 21.3 | 35.6 | 34.1 |
| Enjoy deer but worry About problems deer may cause | 54.1 | 54.4 | 52.8 | 55.8 | 50.8 | 55.6 | 54.4 | 54.0 |
| Do not enjoy deer and regard them as a nuisance | 5.9 | 6.4 | 2.8 | 7.5 | 3.9 | 12.0 | 5.5 | 6.1 |
| Have no particular opinion about deer | 5.3 | 6.1 | 3.9 | 5.2 | 6.4 | 11.1 | 4.5 | 5.9 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table C22.** How respondents weigh the benefits and costs of having deer in their area, by AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=499 | Central New York n=422 | Eastern Lake Plains n=425 | Middle Lake Plains n=416 | Mohawk Valley n=377 | Suffolk West-chester n=313 | Western Lake Plains n=413 | Total n=2,865 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| The benefits of deer outweigh the problems they cause | 26.5 | 21.8 | 28.9 | 19.0 | 27.1 | 20.1 | 24.9 | 24.2 |
| The problems deer Cause outweigh the benefits of deer | 22.6 | 34.6 | 19.3 | 32.2 | 21.8 | 38.7 | 26.6 | 27.5 |
| The benefits of deer and the problems they cause are about an even trade off | 50.9 | 43.6 | 51.8 | 48.8 | 51.2 | 41.2 | 48.4 | 48.3 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table C23.** Density of human population in area where respondents live, by AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=534 | Central New York N=450 | Eastern Lake Plains n=476 | Middle Lake Plains n=455 | Mohawk Valley n=425 | Suffolk West-chester n=350 | Western Lake Plains n=453 | Total n=3,143 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Rural area outside village/hamlet (n=1,385) | 66.1 | 36.9 | 63.2 | 25.3 | 49.6 | 12.6 | 43.0 | 44.1 |
| Village/hamlet (<10,000 people) (n=848) | 25.7 | 28.7 | 14.9 | 26.4 | 24.9 | 49.7 | 24.5 | 27.0 |
| Small city (10,000-50,000 people) (n=647) | 7.9 | 18.9 | 20.8 | 24.8 | 18.6 | 28.6 | 28.5 | 20.6 |
| Large city (>50,000 people) (n=263) | 0.4 | 15.6 | 1.1 | 23.5 | 6.8 | 9.1 | 4.0 | 8.4 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

**Table C24.** Percentage of respondents who participated in activities where they may be impacted positively or negatively by deer, by AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=536 | Central New York N=454 | Eastern Lake Plains n=477 | Middle Lake Plains n=462 | Mohawk Valley n=428 | Suffolk West-chester n=356 | Western Lake Plains n=462 | Total n=3,175 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Gardening (n=2,192) | 71.8 | 62.3 | 64.2 | 72.7 | 65.9 | 74.2 | 72.7 | 69.0 |
| Driving in areas with Lots of deer (n1,987) | 71.1 | 58.6 | 67.1 | 70.1 | 58.2 | 44.4 | 62.6 | 62.6 |
| Hiking/walking in Natural areas (n=2,034) | 67.2 | 63.7 | 61.4 | 68.8 | 65.9 | 61.5 | 59.1 | 64.1 |
| Hunt deer (n=850) | 34.9 | 21.6 | 38.6 | 23.4 | 27.3 | 8.1 | 27.5 | 26.8 |
| Managing woodlots (n=399) | 19.2 | 10.4 | 17.0 | 8.7 | 14.0 | 5.3 | 10.6 | 12.6 |
| Farming (n=330) | 16.8 | 6.2 | 13.2 | 6.9 | 11.4 | 5.9 | 10.2 | 10.4 |
| Participate in none of the activities listed (n=258) | 6.3 | 10.4 | 7.8 | 6.1 | 8.2 | 11.8 | 7.6 | 8.1 |

**Table C25.** Percentage of male and female respondents, by AWMU.

| | Aggregated Wildlife Management Unit (AWMU) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Central Finger Lakes n=526 | Central New York n=453 | Eastern Lake Plains n=475 | Middle Lake Plains n=458 | Mohawk Valley n=426 | Suffolk West-chester n=353 | Western Lake Plains n=459 | Total n=3,150 |
| | (%) | (%) | (%) | (%) | (%) | (%) | (%) | (%) |
| Female | 30.8 | 32.9 | 29.3 | 34.5 | 32.4 | 43.1 | 29.8 | 32.9 |
| Male | 67.1 | 62.9 | 68.8 | 62.4 | 65.0 | 54.4 | 66.7 | 64.3 |
| Prefer not to say | 2.1 | 3.8 | 1.9 | 2.2 | 2.6 | 2.5 | 3.3 | 2.6 |
| Prefer to self-describe | 0 | 0.4 | 0 | 0.9 | 0 | 0 | 0.2 | 0.2 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

## APPENDIX D (Regression Results by Aggregated Wildlife Management Unit)

Table D1. Summary of logistic regression analysis for variables predicting preference for a deer population decrease (yes/no) by respondents in the Central Finger Lakes AWMU.

| | *B* | *SE* | Wald | *Exp(B)* |
|---|---|---|---|---|
| Interest: deer viewing | -0.846*** | 0.148 | 32.503 | 0.429 |
| Interest: deer hunting | -0.052 | 0.161 | 0.103 | 0.950 |
| Concern: deer damage to crops, gardens, or forests (aggregated variable: BrowseConcern) | 0.810*** | 0.181 | 20.132 | 2.248 |
| Concern: tick-borne diseases | 0.370** | 0.167 | 4.915 | 1.448 |
| Concern: deer-vehicle collisions | 0.831*** | .192 | 18.701 | 2.296 |
| Gender: response group 1 (male) | 0.111 | 0.335 | 0.110 | 1.117 |
| Activities: Garden (group: do not) | 0.013 | 0.352 | 0.001 | 1.013 |
| Activities: Farm (group: do not) | 0.887** | 0.412 | 4.623 | 2.427 |
| Activities: Manage forest land (group: do not) | -1.063*** | 0.448 | 5.620 | 0.345 |
| Activities: Hunt deer (group: nonhunters) | -0.501 | 0.529 | 0.896 | 0.606 |
| Activities: Drive in areas with lots of deer (group: do not) | 1.354*** | 0.384 | 12.442 | 3.874 |
| Constant | -6.051 | 0.973 | 38.714 | .002 |
| Model $\chi^2$ | 250.348 | P < 0.001 | | |
| Cox & Snell $R^2$ | 0.420 | | | |
| Nagelkerke $R^2$ | 0.593 | | | |
| Number of cases (n) | 459 | | | |
| % who preferred deer population decrease | 30.7 | | | |
| % of cases correctly classified by model | 85.0 | | | |

*p< .05; **p< .01; ***p< .001

Table D2. Summary of logistic regression analysis for variables predicting preference for a deer population decrease (yes/no) by respondents in the Central New York AWMU.

| | *B* | *SE* | Wald | *Exp(B)* |
|---|---|---|---|---|
| Interest: deer viewing | -0.787*** | 0.142 | 30.626 | 0.455 |
| Interest: deer hunting | -0.180 | 0.198 | 0.831 | 0.835 |
| Concern: deer damage to crops, gardens, or forests (aggregated variable: BrowseConcern) | 0.759*** | 0.173 | 19.154 | 2.137 |
| Concern: tick-borne diseases | 0.523** | 0.192 | 7.389 | 1.687 |
| Concern: deer-vehicle collisions | -0.045 | 0.174 | 0.068 | 0.956 |
| Gender: response group 1 (male) | 0.341 | 0.313 | 1.187 | 1.407 |
| Activities: Garden (group: do not) | 0.418 | 0.299 | 1.950 | 1.518 |
| Activities: Farm (group: do not) | -1.048 | 0.810 | 1.674 | 0.351 |
| Activities: Manage forest land (group: do not) | -0.107 | 0.595 | 0.032 | 0.898 |
| Activities: Hunt deer (group: nonhunters) | -0.595 | 0.678 | 0.769 | 0.552 |
| Activities: Drive in areas with lots of deer (group: do not) | 0.579 | 0.302 | 3.663 | 1.784 |
| Constant | -2.768 | 0.820 | 11.385 | 0.063 |
| Model $\chi^2$ | 184.978 | P < 0.001 | | |
| Cox & Snell $R^2$ | 0.385 | | | |
| Nagelkerke $R^2$ | 0.524 | | | |
| Number of cases (n) | 380 | | | |
| % who preferred deer population decrease | 38.1 | | | |
| % of cases correctly classified by model | 80.5 | | | |

*p< .05; **p< .01; ***p< .001

Table D3. Summary of logistic regression analysis for variables predicting preference for a deer population decrease (yes/no) by respondents in the Eastern Lake Plains AWMU.

| | *B* | *SE* | Wald | *Exp(B)* |
|---|---|---|---|---|
| Interest: deer viewing | -.713*** | .158 | 20.391 | .490 |
| Interest: deer hunting | 0.014 | 0.176 | 0.007 | 1.015 |
| Concern: deer damage to crops, gardens, or forests (aggregated variable: BrowseConcern) | 0.808*** | 0.185 | 19.053 | 2.244 |
| Concern: tick-borne diseases | 0.112 | 0.213 | 0.276 | 1.119 |
| Concern: deer-vehicle collisions | 0.603* | 0.237 | 6.459 | 1.827 |
| Gender: response group 1 (male) | 0.679 | 0.376 | 3.259 | 1.972 |
| Activities: Garden (group: do not) | 0.364 | 0.348 | 1.094 | 1.439 |
| Activities: Farm (group: do not) | -0.593 | 0.546 | 1.180 | 0.553 |
| Activities: Manage forest land (group: do not) | -0.026 | 0.518 | 0.003 | 0.974 |
| Activities: Hunt deer (group: nonhunters) | -0.962 | 0.588 | 2.673 | 0.382 |
| Activities: Drive in areas with lots of deer (group: do not) | 0.541 | 0.361 | 2.243 | 1.717 |
| Constant | -4.997 | 1.065 | 22.037 | 0.007 |
| Model $\chi^2$ | 157.697 | P < 0.001 | | |
| Cox & Snell $R^2$ | 0.324 | | | |
| Nagelkerke $R^2$ | 0.492 | | | |
| Number of cases (n) | 402 | | | |
| % who preferred deer population decrease | 22.9 | | | |
| % of cases correctly classified by model | 84.8 | | | |

*p< .05; **p< .01; ***p< .001

Table D4. Summary of logistic regression analysis for variables predicting preference for a deer population decrease (yes/no) by respondents in the Middle Lake Plains AWMU.

| | *B* | *SE* | Wald | *Exp(B)* |
|---|---|---|---|---|
| Interest: deer viewing | -0.691*** | 0.132 | 27.371 | 0.501 |
| Interest: deer hunting | 0.018 | 0.175 | 0.010 | 1.018 |
| Concern: deer damage to crops, gardens, or forests (aggregated variable: BrowseConcern) | 0.816*** | 0.178 | 21.020 | 2.262 |
| Concern: tick-borne diseases | 0.026 | 0.156 | 0.029 | 1.027 |
| Concern: deer-vehicle collisions | 0.841*** | 0.188 | 19.994 | 2.320 |
| Gender: response group 1 (male) | 0.078 | 0.314 | 0.061 | 1.081 |
| Activities: Garden (group: do not) | 0.099 | 0.322 | 0.095 | 1.104 |
| Activities: Farm (group: do not) | 0.645 | 0.596 | 1.171 | 1.906 |
| Activities: Manage forest land (group: do not) | -0.079 | 0.505 | 0.024 | 0.924 |
| Activities: Hunt deer (group: nonhunters) | 0.140 | 0.577 | 0.059 | 1.150 |
| Activities: Drive in areas with lots of deer (group: do not) | 1.226*** | 0.332 | 13.672 | 3.407 |
| Constant | -5.096 | 0.876 | 33.816 | 0.006 |
| Model $\chi^2$ | 181.377 | P < 0.001 | | |
| Cox & Snell $R^2$ | 0.378 | | | |
| Nagelkerke $R^2$ | 0.508 | | | |
| Number of cases (n) | 382 | | | |
| % who preferred deer population decrease | 42.7 | | | |
| % of cases correctly classified by model | 80.1 | | | |

*p< .05; **p< .01; ***p< .001

Table D5. Summary of logistic regression analysis for variables predicting preference for a deer population decrease (yes/no) by respondents in the Mohawk Valley AWMU.

| | *B* | *SE* | Wald | *Exp(B)* |
|---|---|---|---|---|
| Interest: deer viewing | -0.561*** | 0.155 | 13.119 | 0.571 |
| Interest: deer hunting | -0.153 | 0.210 | 0.531 | 0.858 |
| Concern: deer damage to crops, gardens, or forests (aggregated variable: BrowseConcern) | 0.679*** | 0.182 | 13.946 | 1.973 |
| Concern: tick-borne diseases | -0.135 | 0.186 | 0.527 | 0.874 |
| Concern: deer-vehicle collisions | 1.135*** | 0.229 | 24.520 | 3.112 |
| Gender: response group 1 (male) | -0.519 | 0.344 | 2.276 | 0.595 |
| Activities: Garden (group: do not) | 0.380 | 0.361 | 1.113 | 1.463 |
| Activities: Farm (group: do not) | 0.698 | 0.507 | 1.898 | 2.011 |
| Activities: Manage forest land (group: do not) | -0.020 | 0.538 | 0.001 | 0.980 |
| Activities: Hunt deer (group: nonhunters) | -0.613 | 0.776 | 0.625 | 0.541 |
| Activities: Drive in areas with lots of deer (group: do not) | 0.601 | 0.352 | 2.917 | 1.824 |
| Constant | -5.166 | 1.031 | 25.104 | 0.006 |
| Model $\chi^2$ | 145.069 | P < 0.001 | | |
| Cox & Snell $R^2$ | 0.342 | | | |
| Nagelkerke $R^2$ | 0.501 | | | |
| Number of cases (n) | 346 | | | |
| % who preferred deer population decrease | 26.3 | | | |
| % of cases correctly classified by model | 82.4 | | | |

*p< .05; **p< .01; ***p< .001

Table D6. Summary of logistic regression analysis for variables predicting preference for a deer population decrease (yes/no) by respondents in the Suffolk-Westchester AWMU.

| | *B* | *SE* | Wald | *Exp(B)* |
|---|---|---|---|---|
| Interest: deer viewing | -0.619*** | .153 | 16.337 | 0.539 |
| Interest: deer hunting | -0.363 | 0.200 | 3.280 | 0.696 |
| Concern: deer damage to crops, gardens, or forests (aggregated variable: BrowseConcern) | 0.859*** | 0.193 | 19.716 | 2.361 |
| Concern: tick-borne diseases | 0.489* | 0.197 | 6.144 | 1.631 |
| Concern: deer-vehicle collisions | 0.349 | 0.183 | 3.636 | 1.418 |
| Gender: response group 1 (male) | 1.094** | 0.361 | 9.194 | 2.985 |
| Activities: Garden (group: do not) | -0.205 | 0.391 | 0.274 | 0.815 |
| Activities: Farm (group: do not) | 0.091 | 0.821 | 0.012 | 1.096 |
| Activities: Manage forest land (group: do not) | 0.464 | 0.750 | 0.382 | 1.590 |
| Activities: Hunt deer (group: nonhunters) | 0.608 | 0.809 | 0.565 | 1.838 |
| Activities: Drive in areas with lots of deer (group: do not) | 1.531*** | 0.366 | 17.527 | 4.623 |
| Constant | -4.718 | 1.015 | 21.619 | 0.009 |
| Model $\chi^2$ | 157.070 | P < 0.001 | | |
| Cox & Snell $R^2$ | 0.429 | | | |
| Nagelkerke $R^2$ | 0.572 | | | |
| Number of cases (n) | 280 | | | |
| % who preferred deer population decrease | 49.3 | | | |
| % of cases correctly classified by model | 80.7 | | | |

*p< .05; **p< .01; ***p< .001

Table D7. Summary of logistic regression analysis for variables predicting preference for a deer population decrease (yes/no) by respondents in the Western Lake Plains AWMU.

| | *B* | *SE* | Wald | *Exp(B)* |
|---|---|---|---|---|
| Interest: deer viewing | -0.771*** | 0.133 | 33.472 | 0.463 |
| Interest: deer hunting | 0.220 | 0.184 | 1.425 | 1.246 |
| Concern: deer damage to crops, gardens, or forests (aggregated variable: BrowseConcern) | 0.671*** | 0.166 | 16.299 | 1.955 |
| Concern: tick-borne diseases | 0.037 | 0.157 | 0.056 | 1.038 |
| Concern: deer-vehicle collisions | 0.514** | 0.176 | 8.541 | 1.672 |
| Gender: response group 1 (male) | 0.086 | 0.324 | 0.070 | 1.089 |
| Activities: Garden (group: do not) | -0.441 | 0.314 | 1.971 | 0.643 |
| Activities: Farm (group: do not) | 0.379 | 0.510 | 0.551 | 1.460 |
| Activities: Manage forest land (group: do not) | 0.082 | 0.479 | 0.029 | 1.086 |
| Activities: Hunt deer (group: nonhunters) | -1.123 | 0.604 | 3.454 | 0.325 |
| Activities: Drive in areas with lots of deer (group: do not) | 0.377 | 0.299 | 1.593 | 1.458 |
| Constant | -2.467 | 0.785 | 9.883 | 0.085 |
| Model $\chi^2$ | 144.461 | P < 0.001 | | |
| Cox & Snell $R^2$ | 0.319 | | | |
| Nagelkerke $R^2$ | 0.442 | | | |
| Number of cases (n) | 377 | | | |
| % who preferred deer population decrease | 34.0 | | | |
| % of cases correctly classified by model | 76.7 | | | |

*p< .05; **p< .01; ***p< .001

## APPENDIX E (Regression Results by Aggregated Wildlife Management Unit)

Table E1. Summary of logistic regression analysis for variables predicting preference for a deer population increase (yes/no) by respondents in the Central Finger Lakes AWMU.

| | *B* | *SE* | Wald | *Exp(B)* |
|---|---|---|---|---|
| Interest: deer viewing | 0.562*** | 0.141 | 15.378 | 1.754 |
| Interest: deer hunting | 0.422** | 0.150 | 7.886 | 1.525 |
| Concern: deer damage to crops, gardens, or forests (aggregated variable: BrowseConcern) | -0.713*** | 0.182 | 15.378 | 0.490 |
| Concern: tick-borne diseases | -0.063 | 0.134 | 0.217 | 0.939 |
| Concern: deer-vehicle collisions | -0.283 | 0.142 | 3.984 | 0.753 |
| Gender: response group 1 (male) | 0.280 | 0.345 | 0.656 | 1.322 |
| Activities: Garden (group: do not) | 0.147 | 0.315 | 0.217 | 1.158 |
| Activities: Farm (group: do not) | -0.355 | 0.357 | 0.988 | 0.701 |
| Activities: Manage forest land (group: do not) | -0.375 | 0.344 | 1.185 | 0.688 |
| Activities: Hunt deer (group: nonhunters) | -0.484 | 0.474 | 1.041 | 0.616 |
| Activities: Drive in areas with lots of deer (group: do not) | 0.039 | 0.301 | 0.017 | 1.040 |
| Constant | 0.721 | 0.953 | 0.573 | 0.486 |
| Model $\chi^2$ | 159.053 | P < 0.001 | | |
| Cox & Snell $R^2$ | .293 | | | |
| Nagelkerke $R^2$ | .432 | | | |
| Number of cases (n) | 459 | | | |
| % who preferred deer population increase | 25.3 | | | |
| % of cases correctly classified by model | 81.0 | | | |

*p< .05; **p< .01; ***p< .001

Table E2. Summary of logistic regression analysis for variables predicting preference for a deer population increase (yes/no) by respondents in the Central New York AWMU.

| | *B* | *SE* | Wald | *Exp(B)* |
|---|---|---|---|---|
| Interest: deer viewing | 0.504** | 0.152 | 10.931 | 1.655 |
| Interest: deer hunting | 0.468* | 0.197 | 5.657 | 1.598 |
| Concern: deer damage to crops, gardens, or forests (aggregated variable: BrowseConcern) | -0.259 | 0.221 | 1.380 | 0.772 |
| Concern: tick-borne diseases | -0.210 | 0.180 | 1.359 | 0.811 |
| Concern: deer-vehicle collisions | -0.093 | 0.171 | 0.297 | 0.911 |
| Gender: response group 1 (male) | 0.377 | 0.394 | 0.915 | 1.457 |
| Activities: Garden (group: do not) | -0.072 | 0.343 | 0.045 | 0.930 |
| Activities: Farm (group: do not) | 0.675 | 0.685 | 0.969 | 1.964 |
| Activities: Manage forest land (group: do not) | 0.105 | 0.511 | 0.042 | 1.111 |
| Activities: Hunt deer (group: nonhunters) | -0.806 | 0.667 | 1.460 | 0.446 |
| Activities: Drive in areas with lots of deer (group: do not) | 0.548 | 0.337 | 2.641 | 1.729 |
| Constant | -3.057 | 1.318 | 5.383 | 0.047 |
| Model $\chi^2$ | 92.637 | P < 0.001 | | |
| Cox & Snell $R^2$ | 0.216 | | | |
| Nagelkerke $R^2$ | 0.361 | | | |
| Number of cases (n) | 380 | | | |
| % who preferred deer population increase | 17.1 | | | |
| % of cases correctly classified by model | 86.6 | | | |

*p< .05; **p< .01; ***p< .001

Table E3. Summary of logistic regression analysis for variables predicting preference for a deer population increase (yes/no) by respondents in the Eastern Lake Plains AWMU.

| | *B* | *SE* | Wald | *Exp(B)* |
|---|---|---|---|---|
| Interest: deer viewing | 0.292* | 0.144 | 4.114 | 1.339 |
| Interest: deer hunting | 0.825*** | 0.154 | 28.653 | 2.281 |
| Concern: deer damage to crops, gardens, or forests (aggregated variable: BrowseConcern) | -0.391* | 0.169 | 5.333 | 0.677 |
| Concern: tick-borne diseases | 0.070 | 0.153 | 0.209 | 1.072 |
| Concern: deer-vehicle collisions | -0.360* | 0.161 | 4.994 | 0.698 |
| Gender: response group 1 (male) | -0.009 | 0.394 | 0.001 | 0.991 |
| Activities: Garden (group: do not) | 0.068 | 0.302 | 0.050 | 1.070 |
| Activities: Farm (group: do not) | -0.494 | 0.410 | 1.453 | 0.610 |
| Activities: Manage forest land (group: do not) | 0.110 | 0.372 | 0.088 | 1.117 |
| Activities: Hunt deer (group: nonhunters) | -0.079 | 0.439 | 0.033 | 0.924 |
| Activities: Drive in areas with lots of deer (group: do not) | -0.040 | 0.307 | 0.017 | 0.961 |
| Constant | -2.024 | 0.969 | 4.367 | 0.132 |
| Model $\chi^2$ | 179.996 | P < 0.001 | | |
| Cox & Snell $R^2$ | .361 | | | |
| Nagelkerke $R^2$ | .508 | | | |
| Number of cases (n) | 402 | | | |
| % who preferred deer population increase | 31.1 | | | |
| % of cases correctly classified by model | 82.1 | | | |

*p< .05; **p< .01; ***p< .001

Table E4. Summary of logistic regression analysis for variables predicting preference for a deer population increase (yes/no) by respondents in the Middle Lake Plains AWMU.

| | *B* | *SE* | Wald | *Exp(B)* |
|---|---|---|---|---|
| Interest: deer viewing | .589** | 0.186 | 10.063 | 1.803 |
| Interest: deer hunting | 0.064 | 0.227 | 0.080 | 1.066 |
| Concern: deer damage to crops, gardens, or forests (aggregated variable: BrowseConcern) | -0.681** | 0.258 | 6.979 | 0.506 |
| Concern: tick-borne diseases | 0.372 | 0.204 | 3.336 | 1.451 |
| Concern: deer-vehicle collisions | -0.386 | 0.202 | 3.646 | 0.680 |
| Gender: response group 1 (male) | -1.199* | 0.470 | 6.512 | 0.302 |
| Activities: Garden (group: do not) | -0.442 | 0.425 | 1.083 | 0.643 |
| Activities: Farm (group: do not) | -0.651 | 0.593 | 1.205 | 0.522 |
| Activities: Manage forest land (group: do not) | -0.356 | 0.533 | 0.445 | 0.701 |
| Activities: Hunt deer (group: nonhunters) | -0.266 | 0.725 | .134 | 0.767 |
| Activities: Drive in areas with lots of deer (group: do not) | 0.933* | 0.377 | 6.137 | 2.543 |
| Constant | -1.279 | 1.510 | 0.718 | 0.278 |
| Model $\chi^2$ | 60.925 | P < 0.001 | | |
| Cox & Snell $R^2$ | .147 | | | |
| Nagelkerke $R^2$ | .283 | | | |
| Number of cases (n) | 382 | | | |
| % who preferred deer population increase | 12.0 | | | |
| % of cases correctly classified by model | 88.2 | | | |

*p< .05; **p< .01; ***p< .001

Table E5. Summary of logistic regression analysis for variables predicting preference for a deer population increase (yes/no) by respondents in the Mohawk Valley AWMU.

| | *B* | *SE* | Wald | *Exp(B)* |
|---|---|---|---|---|
| Interest: deer viewing | .627*** | 0.164 | 14.608 | 1.872 |
| Interest: deer hunting | 0.215 | 0.212 | 1.034 | 1.240 |
| Concern: deer damage to crops, gardens, or forests (aggregated variable: BrowseConcern) | -0.508* | 0.198 | 6.554 | 0.602 |
| Concern: tick-borne diseases | 0.396* | 0.161 | 6.027 | 1.486 |
| Concern: deer-vehicle collisions | -0.614*** | 0.165 | 13.933 | 0.541 |
| Gender: response group 1 (male) | -0.614 | 0.412 | 2.214 | 0.541 |
| Activities: Garden (group: do not) | 0.153 | 0.338 | 0.205 | 1.165 |
| Activities: Farm (group: do not) | 0.335 | 0.476 | 0.496 | 1.398 |
| Activities: Manage forest land (group: do not) | -0.021 | 0.445 | 0.002 | 0.979 |
| Activities: Hunt deer (group: nonhunters) | -0.810 | 0.728 | 1.238 | 0.445 |
| Activities: Drive in areas with lots of deer (group: do not) | 0.113 | 0.340 | 0.110 | 1.119 |
| Constant | -1.790 | 1.284 | 1.945 | 0.167 |
| Model $\chi^2$ | 136.034 | P < 0.001 | | |
| Cox & Snell $R^2$ | .325 | | | |
| Nagelkerke $R^2$ | .474 | | | |
| Number of cases (n) | 346 | | | |
| % who preferred deer population increase | 26.6 | | | |
| % of cases correctly classified by model | 84.7 | | | |

*p< .05; **p< .01; ***p< .001

Table E6. Summary of logistic regression analysis for variables predicting preference for a deer population increase (yes/no) by respondents in the Suffolk-Westchester AWMU.

| | *B* | *SE* | Wald | *Exp(B)* |
|---|---|---|---|---|
| Interest: deer viewing | 0.753** | 0.253 | 8.863 | 2.123 |
| Interest: deer hunting | -0.075 | 0.323 | 0.054 | 0.928 |
| Concern: deer damage to crops, gardens, or forests (aggregated variable: BrowseConcern) | -0.281 | 0,342 | 0.676 | 0.755 |
| Concern: tick-borne diseases | -0.091 | 0.234 | 0.151 | 0.913 |
| Concern: deer-vehicle collisions | -0.429 | 0.241 | 3.185 | 0.651 |
| Gender: response group 1 (male) | -0.506 | 0.584 | 0.751 | 0.603 |
| Activities: Garden (group: do not) | 0.785 | 0.626 | 1.571 | 2.192 |
| Activities: Farm (group: do not) | -0.320 | 1.199 | 0.071 | 0.726 |
| Activities: Manage forest land (group: do not) | -0.578 | 0.937 | 0.380 | 0.561 |
| Activities: Hunt deer (group: nonhunters) | -0.861 | 1.195 | 0.519 | 0.423 |
| Activities: Drive in areas with lots of deer (group: do not) | -0.184 | 0.532 | 0.119 | 0.832 |
| Constant | -0.660 | 2.417 | 0.074 | 0.517 |
| Model $\chi^2$ | 30.125 | P = 0.002 | | |
| Cox & Snell $R^2$ | .102 | | | |
| Nagelkerke $R^2$ | .247 | | | |
| Number of cases (n) | 280 | | | |
| % who preferred deer population increase | 7.5 | | | |
| % of cases correctly classified by model | 92.9 | | | |

*p< .05; **p< .01; ***p< .001

Table E7. Summary of logistic regression analysis for variables predicting preference for a deer population increase (yes/no) by respondents in the Western Lake Plains AWMU.

| | *B* | *SE* | Wald | *Exp(B)* |
|---|---|---|---|---|
| Interest: deer viewing | 0.346* | 0.159 | 4.731 | 1.413 |
| Interest: deer hunting | 0.551** | 0.198 | 7.742 | 1.735 |
| Concern: deer damage to crops, gardens, or forests (aggregated variable: BrowseConcern) | -0.817*** | 0.226 | 13.111 | 0.442 |
| Concern: tick-borne diseases | -0.121 | 0.166 | 0.537 | 0.886 |
| Concern: deer-vehicle collisions | -0.013 | 0.168 | 0.006 | 0.987 |
| Gender: response group 1 (male) | -0.667 | 0.434 | 2.362 | 0.513 |
| Activities: Garden (group: do not) | -0.471 | 0.367 | 1.651 | 0.624 |
| Activities: Farm (group: do not) | 0.269 | 0.470 | 0.327 | 1.308 |
| Activities: Manage forest land (group: do not) | 0.724 | 0.496 | 2.133 | 2.062 |
| Activities: Hunt deer (group: nonhunters) | -0.501 | 0.603 | 0.691 | 0.606 |
| Activities: Drive in areas with lots of deer (group: do not) | 0.506 | .339 | 2.229 | 1.659 |
| Constant | -2.248 | 1.224 | 3.375 | 0.106 |
| Model $\chi^2$ | 102.370 | P < 0.001 | | |
| Cox & Snell $R^2$ | .238 | | | |
| Nagelkerke $R^2$ | .378 | | | |
| Number of cases (n) | 377 | | | |
| % who preferred deer population increase | 19.6 | | | |
| % of cases correctly classified by model | 83.6 | | | |

*p< .05; **p< .01; ***p< .001